

**IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF TEXAS
WACO DIVISION**

**TRAXCELL TECHNOLOGIES, LLC,
Plaintiff,**

v.
**GOOGLE LLC,
Defendant.**

CASE NO. 6:21-cv-00023

JURY DEMAND

PLAINTIFF'S ORIGINAL COMPLAINT FOR PATENT INFRINGEMENT

Traxcell Technologies, LLC. (“Traxcell”) files this Original Complaint, and demand for jury trial seeking relief from patent infringement by Google LLC (“Defendant” or “Google”), alleging infringement of the claims of U.S. Pat. No. 9,918,196, U.S. Pat. No. 9,549,388, and U.S. Pat. No. 10,820,147 (collectively referred to as “Patents-in-Suit”), as follows:

I. THE PARTIES

1. Plaintiff Traxcell is a Texas Limited Liability Company, with its principal place of business located at 103 Country Club Drive. #508, Marshall, Texas 75672.
2. Defendant Google LLC is a Delaware corporation with a principal place of business located at 1600 Amphitheater Parkway, Mountain View, California 94043. Google designs, manufactures, uses, imports into the United States, sells, and/or offers for sale in the United States smartphones, tablets, iPods, desktop computers, and notebook computers that use Google Maps. Google markets, sells, and offers to sell its products and/or services, including those accused herein of infringement, to actual and potential customers and end-users located in Texas and in the judicial Western District of Texas such as at the Google maintains a permanent physical presence within the Western District of Texas, conducting business from at least its locations at: 9606 North Mo-Pac Expressway, Suite 700, Austin, Texas 78759; 500 West 2nd Street, Suite 2000, Austin, Texas

78701; 4100 Smith School Road, Austin, Texas 78744; as well as other locations in and around the Austin area.

3. Google is registered to do business in Texas and can be served via its registered agent, Corporation Service Company dba CSC – Lawyers Incorporating Service Company at 211 East 7th Street, Suite 620, Austin, Texas 78701-3218.

4. Google has placed or contributed to placing infringing products like the Google Maps for use on a computing device connected to a wireless network into the stream of commerce via an established distribution channel knowing or understanding that such products would be sold and used in the United States, including in the Western District of Texas. On information and belief, Google also has derived substantial revenues from infringing acts, including but not limited to advertising, business APIs, private usage, OEM usage, and/or the like.

II. JURISDICTION AND VENUE

5. This is an action for patent infringement arising under the patent laws of the U.S., 35 U.S.C. §§ 1 et. seq. This Court has subject matter jurisdiction pursuant to 28 U.S.C. §§ 1331, 1332(a) and 1338(a).

6. This Court has personal jurisdiction over Defendants because: Defendants are present within or has minimum contacts within the State of Texas and this judicial district; Defendants have purposefully availed itself of the privileges of conducting business in the State of Texas and in this judicial district; Defendants regularly conducts business within the State of Texas and within this judicial district; and Plaintiff's cause of action arises directly from Defendants' business contacts and other activities in the State of Texas and in this judicial district. The amount in controversy is more than \$75,000.00.

7. Venue is proper in this judicial district per 28 U.S.C. §§ 1331 and 1400(b). Google has committed acts of infringement in this judicial district and maintains regular and established places of business in this district, as set forth above. Google has continuous and systematic business contacts with the State of Texas. Google, directly or through subsidiaries or intermediaries (including distributors, retailers, contract manufacturers, and others), conducts its business extensively throughout Texas, by shipping, manufacturing, distributing, offering for sale, selling, and advertising (including the provision of interactive web pages) its products and services in the State of Texas and the Western District of Texas. Google, directly or through subsidiaries or intermediaries (including distributors, retailers, contract manufacturers, and others), has purposefully and voluntarily placed its infringing products and services into this District and into the stream of commerce with the intention and expectation that they will be purchased and used by consumers in this District.

III. INFRINGEMENT ('196 Patent (attached as Exhibit A))

8. On March 13, 2018, U.S. Patent No. 9,918,196 ("the '196 patent"), attached as Exhibit A, entitled "Internet queried directional navigation system with mobile and fixed originating location determination" was duly and legally issued by the U.S. Patent and Trademark Office. Traxcell owns the '196 patent by assignment.
9. The '196 Patent's Abstract states, "A mobile wireless network and a method of operation provide directional assistance in response to an Internet query. The directional assistance is provided from a location of the querying device to a destination that may be selectively prompted based on whether the destination is a nearby business, a type of business, a street address, or another mobile device or fixed telephone location. The location of the querying

device is also selectively determined depending on whether the querying device is a wireless device such as a mobile telephone, or whether the device has a presumed fixed location, such as an ordinary telephone connected to a public-switched telephone network (PSTN).

10. The following preliminary exemplary chart provides notice of Traxcell's allegations of infringement.

Exemplary Claim	Corresponding Structure in Accused Systems
<p>A method of providing navigation assistance to a user of a communications device, the method comprising:</p>	<p>The Google Maps online navigation service and the Google Maps server-side or cloud infrastructure needed to provide the service, constitute the “Accused System”.</p> <p>The term “Google Maps” encompasses and includes all the versions and variants of the Google Maps web (for PC) and the Google Maps app (Google Maps app for Android and iOS devices) and the applications supported by the Google Maps Platform.</p> <p>The “method of providing navigation assistance to a user of a communications device” refers to the method by which Google Maps provides online navigation assistance (directions) to a user of a communications device or UE (example: mobile phone, smartphone, laptop, tablet, iPhone, iPad etc.) including the Google Maps app or including a browser plugin enabling access to the Google Maps website or having other means to access the Google Maps website, for querying and receiving navigation instructions for travelling from a starting location (current location of the communications device or a location specified by its user as the ‘origin’) to a destination location (a location specified by the said user as the ‘destination’).</p> <p>The “communications device” refers to a UE (example: mobile phone, smartphone, laptop, tablet, iPhone, iPad etc.) including the Google Maps app or including a browser plugin enabling access to the Google Maps website or having other means to access the Google Maps website for querying and receiving navigation instructions for travelling from a starting location (current location of the communications device or a location specified by its user as the ‘origin’) to a destination location (a location specified by the said user as the ‘destination’).</p>

Exemplary Claim	Corresponding Structure in Accused Systems
	<p>The said “communications device” (the user of the said “communications device”) is device of including but not limited to Verizon, T-Mobile, Sprint, SPRINT, Nokia, and the other United States communications device provider.</p> <p>Verizon, T-Mobile, Sprint, supports the Google Maps online navigation service on devices that are subscribed to wireless telecommunications network services of the Verizon, T-Mobile, Sprint, SPRINT, Nokia or any other united states carrier. Verizon, T-Mobile, SPRINT, etc. provides the mobile data service required to use the Google Maps online navigation service.</p> <p>Google Maps provides navigation assistance (directions) to a “user of a communications device” for travelling from a starting location (Ex: Starbucks, 13-25 Astor Pl, New York, NY 10003, USA) to a destination location (Ex: Central Park South, New York, NY, USA).</p>
receiving, by a directional assistance service, an Internet query initiated at the communications device and directed via the Internet to initiate a request for navigational assistance to a destination;	<p>Navigation using Google Maps online navigation service is a well-known example of off board navigation. To elaborate, an off board navigation system is a client/server system wherein only the user interface (UI) resides on the client's (user's) communications device and all the databases (GIS and/or mapping) and infrastructure required for computation (of route, distance, travel time, traffic etc.) reside remotely on a server or a network of servers (the server-side) located on the world wide web (www). The server-side could also comprise virtual (instead of physical) or cloud server infrastructure. The client side (user interface or UI at a user's communications device) can only communicate with the server-side via the Internet.</p> <p>This claim element refers to the method and process involved in initiating a navigation query, using Google Maps online navigation service, to obtain directions (navigation assistance) for travelling from a starting location to a destination location. The process involved in initiating the said navigation query includes inputting a destination location at the Google Maps' user interface (UI) at the user's communications device, and sending the said query via Internet to the remote Google Maps server (cloud server). The said remote Google Maps server (cloud server) receives the said query via Internet.</p> <p>The term “directional assistance service” herein refers to Google Maps online navigation service supported and facilitated by wireless telecommunications network of the Verizon, T-Mobile, Sprint, SPRINT, Nokia or any other united states carrier.</p>

Exemplary Claim	Corresponding Structure in Accused Systems
	<p>The “communications device” refers to a UE (example: mobile phone, smartphone, laptop, tablet, iPhone, iPad etc.) including the Google Maps app or including a browser plugin enabling access to the Google Maps website or having other means to access the Google Maps website, for querying and receiving navigation instructions for travelling from a starting location (current location of the communications device or a location specified by its user as the ‘origin’) to a destination location (a location specified by the said user as the ‘destination’).</p> <p>The method of using the Google Maps for navigation includes initiating a query at the communications device to initiate a request for navigational assistance for travelling from a starting point (which could be the current location of the user’s communications device) to a destination, by specifying (inputting) the destination and the starting point (if different from the current location of the user’s communications device).</p> <p>The said query is directed via the Internet to the remote Google Maps server (cloud server). In other words, the Google Maps server (cloud server) receives the said query through the Internet. Google Maps online navigation is an example of off board navigation. In other words, Google Maps online navigation system is a client/server system wherein only the user interface (UI) resides on the client’s (user’s) communications device and all the databases (GIS and/or mapping) and infrastructure required for computation (of route, distance, travel time, traffic etc.) reside remotely on a Google Maps server or a network of servers (the server-side) located on the world wide web (www). The server-side could also comprise virtual (instead of physical) or cloud server infrastructure. The client side (user interface or UI at a user’s communications device) can only communicate with the server-side via the Internet. In other words, destination is input and a query is initiation at the Google Maps user interface (UI) at the client device and the query (including the input destination) is communicated from the client-side (client or user’s communications device) to the remote server-side (Google Maps server) via the Internet. The Google Maps server, upon receiving the query (including the input destination) communicated from the client-side (client or user’s communications device) via the Internet, identifies the required map tiles (or grid squares), computes or calculates the route(s), and downloads the required map tiles (or grid squares) and the computed or calculated route(s) to the client-side (client or user’s communications device) via the Internet.</p> <p>The aforementioned fact that Google Maps online navigation is an example of off-board navigation is established from the following details available in the public domain –</p> <p>a) In Attachment 8, which is a copy of information on off-board navigation available on the Wikipedia, Google Maps (online navigation) is cited as an example of off-board navigation system. The following is mentioned therein –</p>

Exemplary Claim	Corresponding Structure in Accused Systems
	<p>“In addition to navigation software, there are also route planner as offboard solution. The difference to the conventional route planning in the Internet is the possibility of the location transmission of the user. Google Maps offers such a mobile route planner with the Google Maps Mobile software.”</p> <p>Attachment 8 also elaborates on and describes off-board navigation. The following is mentioned therein –</p> <p>“The offboard navigation allows the use of a mobile phone as a navigation system, with the route data and maps not stored on the device. Using special navigation software, the user contacts an external server via UMTS or GPRS and downloads the desired route information and maps from there. In everyday language, off-board navigation is also called "mobile phone navigation".</p> <p>“The difference between offboard navigation and onboard navigation: In the case of onboard navigation, the route data and maps are stored together with navigation software in the mobile device. This requires a lot of storage space, so onboard navigation is only suitable for devices with a larger processor and more storage space, such as PDAs and smartphones. For offboard navigation, however, are now many popular mobile phones with Java operating system (J2ME). A prerequisite for offboard navigation is that the mobile phone can connect to the Internet via UMTS or GPRS. Both variants require GPS reception. It must therefore have an integrated or an externally connected GPS receiver (GPS mouse). If an external GPS receiver is used, the two devices are now usually coupled together via Bluetooth.”</p> <p>b) In Attachment 9, which is a copy of information on Google Maps navigation available on the Wikipedia, Google Maps (online navigation) is described as an off-board navigation system, which subsequent to receiving a destination input at the client-side user interface (UI) obtains map and route information (from its server) via the Internet. The following is mentioned therein –</p> <p>“Google Maps Navigation is a mobile application developed by Google for the Android and iOS operating systems that was later integrated into the Google Maps mobile app. The application uses an Internet connection to a GPS navigation system to provide turn-by-turn voice-guided instructions on how to arrive at a given destination. The application requires connection to Internet data (e.g. 3G, 4G, WiFi, etc.) and normally uses a GPS satellite connection to determine its location. A user can enter a destination into the application, which will plot a path to it. The app displays the user's progress along the route and issues instructions for each turn.”</p>

Exemplary Claim	Corresponding Structure in Accused Systems
	<p>“Once the user has searched for a destination, the map will cache along the intended route. Note that the application requires an Internet connection to search for the route, but once a route has been found, the user no longer requires an Internet connection as the route is temporarily saved onto the device.”</p> <p>c) In Attachment 10, which is a copy of information on Google Maps available on the Wikipedia, Google Maps (online navigation) is described as an off-board navigation system, wherein subsequent to inputting a destination input at the client-side user interface (UI) map tiles (or grid squares) are downloaded to the client-side (user’s communications device) from the remote Google Maps server via the Internet. The following is mentioned therein –</p> <p>“As the user drags the map, the grid squares are downloaded from the server and inserted into the page. When a user searches for a business, the results are downloaded in the background for insertion into the side panel and map; the page is not reloaded.”</p> <p>d) Attachment 11 describes Google Maps (online navigation) as an online and off board navigation system, which upon destination input and query initiation at the UI at the client device, downloads maps to the client device from its remote server via Internet. Attachment 11 also elaborates on and describes a typical “online/off board navigation system”.</p> <p>The following is mentioned therein –</p> <p>“Navigation online / offboard This refers to a navigation solution that does not store your maps in the internal memory of the smartphone or on its SD card, but during use continuously from a server on the Internet. Thus, a continuous, wideband broadband Internet connection (UMTS, HSDPA, in the future also LTE) during the navigation is mandatory requirement.</p> <p>Benefits of this online solution: You do not have to worry about map updates, but always automatically use the most up-to-date maps available. In addition, the two most popular online navigation solutions for Android are free: Skobbler from a Berlin company and the well-known Google Maps Navigation.”</p> <p>Attachment 11 also mentions the amount of data Google Maps (online navigation) requires. The following is mentioned therein –</p>

Exemplary Claim	Corresponding Structure in Accused Systems
	<p>“However, these free online solutions certainly have disadvantages: they cause considerable data traffic between the server of the navigation solution provider and your smartphone. If you only select the map view on Google Maps, you can significantly reduce the traffic: A 55-kilometer route caused only 1 MB of traffic in Google Maps Navigation in the map view. In the satellite view, it was on the same route 11 MB of traffic!”</p> <p>“And of course, an online solution requires a good internet connection. So, if you're often away from metropolitan areas in areas with poor data connectivity and therefore usually surf at edge speeds, then you should opt for an onboard solution. However, the use of Google Maps Navigation worked well with Edge, if you do not unnecessarily increase the resulting traffic. Therefore, our tip: With an online navigation solution like Google Maps Navigation, you should do without the satellite view and only choose the map view if the internet connection is poor and / or the monthly traffic limit is low.”</p> <p>e) Attachment 12 describes Google Maps (online navigation) as an off board navigation system, which upon destination input and query initiation at the UI at the client device, downloads maps to the client device from its remote server via Internet. The following is mentioned therein – “Using GPS and mobile network, Google Maps locates you with astonishing precision. If you are looking for restaurants, petrol stations or ATMs, you will not only get the corresponding contact details and the position on the map, but you can also be directed there directly. With Google Map you always check your current position and find the best route to your desired destination. Who wants to use the free navigation frequently, should get an internet flat rate, as Google Maps pulls the map data from the Internet (Offboard- Navigation).”</p> <p>f) Attachment 4 indicates that Google Maps (online navigation) is an off board navigation system, which upon destination input and query initiation at the UI at the client device, downloads maps to the client device from its remote server via Internet. It also confirms that wireless telecommunications network (T-Mobile, Verizon, SPRINT, etc.) provides the mobile data service required to use the Google Maps online navigation service. The following is mentioned therein –</p> <p>“Google maps has offline maps feature save mobile data. Global Positioning Service - GPS is provided free of cost by satellite everywhere. Data will be used to get maps on the go with T Mobile, Verizon, Sprint, Airtel, Vodafone.”</p> <p>“Google maps app is FREE to use but they do need area maps to be downloaded. Google maps allows offline or without internet access of their maps, if you have downloaded them earlier on your mobile.”</p>

Exemplary Claim	Corresponding Structure in Accused Systems
	<p>“If not downloaded, and you use Google maps to find directions using your own FREE GPS receiver (installed in your smartphone) using your mobile internet connection to get maps on the go and show you directions.”</p> <p>“Remember, Google maps (if maps not already available) would need the internet connection and would incur internet data charges in roaming.”</p> <p>So, based on the foregoing information it is established that navigation using Google Maps online navigation service is an example of off board navigation. As we have learnt, an off board navigation system is a client/server system wherein only the user interface (UI) resides on the client’s (user’s) communications device and all the databases (GIS and/or mapping) and infrastructure required for computation (of route, distance, travel time, traffic etc.) reside remotely on a server or a network of servers (the server-side) located on the world wide web (www). The server-side could also comprise virtual (instead of physical) or cloud server infrastructure. The client side (user interface or UI at a user’s communications device) can only communicate with the server-side via the Internet. In other words, destination is input and a query is initiation at the Google Maps user interface (UI) at the client device and the query (including the input destination) is communicated from the client-side (client or user’s communications device) to the remote server-side (Google Maps server) via the Internet. The Google Maps server, upon receiving the query (including the input destination) communicated from the client-side (client or user’s communications device) via the Internet, identifies the required map tiles (or grid squares), computes or calculates the route(s), and downloads the required map tiles (or grid squares) and the computed or calculated route(s) to the client-side (client or user’s communications device) via the Internet.</p> <p>The said query is communicated from the Google Maps’ client-side to the Google Maps server in the form of a URL</p> <p>The method of using the Google Maps for navigation includes initiating a query at the communications device to initiate a request for navigational assistance for travelling from a starting point (which could be the current location of the user’s communications device) to a destination, by specifying (inputting) the destination and the starting point (if different from the current location of the user’s communications device).</p> <p>The said query is directed via the Internet to the remote Google Maps server (cloud server). In other words, the Google Maps server (cloud server) receives the said query through the Internet.</p>

Exemplary Claim	Corresponding Structure in Accused Systems
<p>responsive to receiving the Internet query, determining whether or not the communications device is a mobile wireless communications device;</p>	<p>Google Maps is programmed to identify the “phone type” (or device type) and the “unique identifier” of the communications device (UE) at which the said navigation query is initiated. In other words, Google Maps determines whether or not the said communications device (UE) is a mobile wireless communications device (UE).</p> <p>“a mobile wireless communications device” refers to a mobile wireless communications device or UE (example: mobile phone, smartphone, laptop, tablet, iPhone, iPad etc.), which includes the Google Maps app or includes a browser plugin enabling access to the Google Maps website or has other means to access the Google Maps website for querying and receiving navigation instructions for travelling from a starting point (current location of the communication’s device or a location specified by its user as the ‘origin’) to a destination location (a location specified by the said user as the ‘destination’).</p> <p>In Attachment 20, Google Privacy Policy document, it is clearly mentioned that Google (Google Maps) collects information such as device type, phone number and unique identifiers pertaining to the communications device (UE) at which a navigation query is initiated and communicated to the Google Maps server. In other words, Google Maps has means to determine whether a querying communications device (UE) is a mobile wireless communications device (UE) or not.</p> <p>The following is mentioned therein –</p> <p>“Information we collect as you use our services</p> <p>From the aforementioned, it is also confirmed that whenever a communications device uses Google Maps, information such as mobile network information including name of the carrier serving the said communications device are collected by Google (Google Maps). In other words, Google Maps can also ascertain whether the communications device (UE) at which the said navigation query is initiated, is connected to the Google Maps server through a wireless telecommunications network service (i.e. through RF signal-based communication) or through a Wi-Fi network supported by a fixed-line or wired broadband Internet service.</p> <p>A copy of the Google Play webpage displaying information on Google Maps app updated on November 8, 2018, it is clearly mentioned that the Google Maps app has access to Phone, Device ID and Call information pertaining to the device on which it is installed, and it can read “phone status and identity”. In other words, Google Maps has means to determine whether a querying communications device (UE) is a mobile wireless communications device (UE) or not.</p> <p>Google Maps app installed on a communications device can “view Wi-Fi connections” and can “view network connections” pertaining to the said communications device.</p>

Exemplary Claim	Corresponding Structure in Accused Systems
	<p>In other words, Google Maps can also ascertain whether the communications device (UE) at which the said navigation query is initiated, is connected to the Google Maps server through a wireless telecommunications network service (i.e. through RF signal-based communication) or through a Wi-Fi network supported by a fixed-line or wired broadband Internet service.</p> <p>In summary, Google Maps has means to determine whether a querying communications device (UE) is a mobile wireless communications device (UE) or not, and also whether the said communications device (UE) is connected to the Google Maps server through a wireless telecommunications network service (i.e. through RF signal-based communication) or through a Wi-Fi network supported by a fixed-line or wired broadband Internet service.</p>
<p>responsive to determining that the communications device is the mobile wireless communications device, the directional assistance service determining and using a present location of the mobile wireless communications device as a location of the communications device;</p>	<p>If the Google Maps online navigation service determines that the said navigation query has been initiated at a mobile wireless communications device (UE), and that the said query was communicated through a wireless telecommunications network service (i.e. through RF signal-based communication), Google Maps determines current location of the mobile wireless communications device (UE) and uses it as the starting point for providing navigation information (instructions or directions) to travel to the destination input by the user of the said communications device (UE).</p> <p>The “the mobile wireless communications device” or the “communications device” refers to the mobile wireless communications device or UE (example: mobile phone, smartphone, laptop, tablet, iPhone, iPad etc.) at which the navigation query was initiated.</p> <p>A user can simply input a “destination” entry and initiate a navigation query on the Google Maps’ client-side user interface (UI) at the user’s mobile wireless communications device (Google Maps app on an Android smartphone). The Google Maps server, upon receiving the navigation query (including input “destination”) from the client-side via Internet, determines the “current location” of the user’s mobile wireless communications device, uses it as the default starting point, ascertains the location of the input “destination”, computes or calculates the route(s) and directions, and downloads the computed or calculated route(s) and directions to the user’s mobile wireless communications device.</p> <p>A user can simply input a “destination” entry and initiate a navigation query on the Google Maps’ client-side user interface (UI) at the user’s mobile wireless communications device (Google Maps app on an Android smartphone). The Google Maps server, upon receiving the navigation query (including input “destination”) from the client-side via Internet, determines the “current location” of the user’s mobile wireless communications device, uses it as the default starting point, ascertains the location of the input “destination”, computes or calculates the</p>

Exemplary Claim	Corresponding Structure in Accused Systems
	<p>route(s) and directions, and downloads the computed or calculated route(s) and directions to the user's mobile wireless communications device.</p> <p>As has been mentioned with reference to the previous claim element, Google Maps, upon receiving a navigation query from a user's communications device, determines whether or not the said communications device is a mobile wireless communications device.</p> <p>A user can simply input a "destination" entry and initiate a navigation query on the Google Maps' client-side user interface (UI) at the user's mobile wireless communications device (Google Maps app on a smartphone). Implying that the Google Maps server, upon receiving the navigation query (including input "destination") from the client-side via Internet, determines the "current location" of the user's mobile wireless communications device, uses it as the default starting point, ascertains the location of the input "destination", computes or calculates the route(s) and directions, and downloads the computed or calculated route(s) and directions to the user's mobile wireless communications device.</p> <p>A user can simply input a "destination" entry and initiate a navigation query on the Google Maps' client-side user interface (UI) at the user's mobile wireless communications device (Google Maps app on an Android phone or tablet). The Google Maps server, upon receiving the navigation query (including input "destination") from the client-side via Internet, determines the "current location" of the user's mobile wireless communications device, uses it as the default starting point, ascertains the location of the input "destination", computes or calculates the route(s) and directions, and downloads the computed or calculated route(s) and directions to the user's mobile wireless communications device.</p>
responsive to determining that the communications device is not the mobile wireless communications device, obtaining a fixed location associated with the communications device to determine the location of the	<p>As mentioned previously, Google Maps is programmed to identify the "phone type" (or device type) of the communications device (UE) at which the said navigation query is initiated, and also to ascertain whether the communications device (UE) at which the said navigation query is initiated, is connected to the Google Maps server through a wireless telecommunications network service (i.e. through RF signal-based communication) or through a Wi-Fi network supported by a fixed-line or wired broadband Internet service.</p> <p>In other words, Google Maps has means to determine whether a querying communications device (UE) is a mobile wireless communications device (UE) or not, and also whether the said communications device (UE) is connected to the Google Maps server through a wireless telecommunications network service (i.e. through RF signal-based communication) or through a Wi-Fi network supported by a fixed-line or wired broadband Internet service.</p>

Exemplary Claim	Corresponding Structure in Accused Systems
communications device; and	<p>In the Google Privacy Policy document, it is clearly mentioned that Google (Google Maps) collects information such as device type, phone number and unique identifiers pertaining to the communications device (UE) at which a navigation query is initiated and communicated to the Google Maps server. In other words, Google Maps has means to determine whether a querying communications device (UE) is a mobile wireless communications device (UE) or not. The following is mentioned therein:</p>
<p>the directional assistance service providing navigation information to the communications device in response to the Internet query, wherein the navigation provides directions for proceeding from the location of the communications device to a location of the destination.</p>	<p>In response to receiving the navigation query (which includes the “destination” entry input by the user at the Google Maps client-side user interface or UI residing at the user’s communications device) initiated at the communications device (UE) and directed via the Internet, Google Maps server determines the current location of the querying (the user’s) communications device, considers it the default starting point, ascertains the location of the input “destination”, computes and provides the navigation information (directions) to the said communications device (UE) to travel from the current location of said communications device (UE) to the input destination.</p> <p>A user can simply input a “destination” entry and initiate a navigation query on the Google Maps’ client-side user interface (UI) at the user’s mobile wireless communications device (Google Maps app on an Android smartphone). The Google Maps server, upon receiving the navigation query (including input “destination”) from the client-side via Internet, determines the “current location” of the user’s mobile wireless communications device, uses it as the default starting point, ascertains the location of the input “destination”, computes or calculates the route(s), and downloads the computed or calculated route(s) to the user’s mobile wireless communications device. In this manner, Google Maps provides the navigation information (directions) to the said communications device (UE) to travel from the current location of said communications device (UE) to the input destination.</p> <p>A user can simply input a “destination” entry and initiate a navigation query on the Google Maps’ client-side user interface (UI) at the user’s mobile wireless communications device (Google Maps app on an Android smartphone). The Google Maps server, upon receiving the navigation query (including input “destination”) from the client-side via Internet, determines the “current location” of the user’s mobile wireless communications device, uses it as the default starting point, ascertains the location of the input “destination”, computes or calculates the route(s), and downloads the computed or calculated route(s) to the user’s mobile wireless communications device. In this manner, Google Maps provides the navigation information (directions) to the said communications device (UE) to travel from the current location of said communications device (UE) to the input destination.</p>

11. Defendant makes, uses, offers to sell, and/or sells within or imports into the wireless-network components, related applications and programs, and related services that use identified locations of wireless devices to provide directional assistance such that

Defendant infringes claims 1–30 of the ’196 patent, literally or under the doctrine of equivalents.

12. Defendant put the inventions claimed by the ’196 Patent into service (i.e., used them); but for Defendant’s actions, the claimed-inventions embodiments involving Defendant’s products and services would never have been put into service. Defendant’s acts complained of herein caused those claimed-invention embodiments as a whole to perform, and Defendant obtaining monetary and commercial benefit from it.
13. Defendant has and continues to induce infringement. Defendants have actively encouraged or instructed others (e.g., its customers, such as Verizon, T-Mobile and Sprint), and continues to do so, on how to use its products and services (e.g., wireless-network components and related applications and programs that use identified locations of wireless devices to provide directional assistance) such to cause infringement claims 1–30 of the ’196 patent, literally or under the doctrine of equivalents. Moreover, Defendant has known and should have known of the ’196 patent, by at least by the date of the patent’s issuance, or from the issuance of the ‘284 patent, which followed the date that the patent’s underlying application was cited to Defendants by the U.S. Patent and Trademark Office during prosecution of one of Defendant’s patent applications, such that Defendant knew and should have known that it was and would be inducing infringement.
14. Defendant has and continues to contributorily infringe. Defendant has actively encouraged or instructed others (e.g., its customers and/or the customers of its related companies, such as Verizon, T-Mobile and Sprint), and continues to do so, on how to use its products and services e.g., wireless-network components and related applications and programs that use identified locations of wireless devices to provide directional assistance) such as to cause

infringement of one or more of claims 1–30 of the '196 patent, literally or under the doctrine of equivalents. Moreover, Defendant has known of the '196 patent and the technology underlying it from at least the date of issuance of the patent or from the issuance of the '284 patent, which followed the date that the patent's underlying application was cited to Defendants by the U.S. Patent and Trademark Office during prosecution of one of Defendant's patent applications, such that Defendant knew and should have known that it was and would be contributorily infringing.

15. Defendants have caused and will continue to cause Traxcell damage by infringing the '196 patent.

IV. INFRINGEMENT ('388 Patent (Attached as exhibit B))

16. On January 17, 2017, U.S. Patent No. 9,549,388 ("the '388 patent") entitled "Mobile wireless device providing off-line and on-line geographic navigation information" (attached as Exhibit D) was duly and legally issued by the U.S. Patent and Trademark Office. Traxcell owns the '388 patent by assignment.

17. The '388 Patent's Abstract states, "A mobile device, wireless network and their method of operation provide both on-line (connected) navigation operation, as well as off-line navigation from a local database within the mobile device. Routing according to the navigation system can be controlled by traffic congestion measurements made by the wireless network that allow the navigation system to select the optimum route based on expected trip duration."

18. The following preliminary exemplary chat provides Traxcell's allegations of infringement.

Exemplary Claim	Corresponding Structure in Accused Systems
A wireless communications system including:	The Google Maps online navigation service and the Google Maps server-side or cloud infrastructure needed to provide the service, constitute the “Accused System”.
a first radio-frequency transceiver within a wireless mobile communications device and an associated first antenna to which the first radio-frequency transceiver is coupled, wherein the first radio-frequency transceiver is configured for radio-frequency communication with a wireless communications network;	<p>When a wireless communication device transceivers and antennas are in communication, they are coupled. Further, in addition to being so coupled, the transceiver of each Exhibit-B item is also configured for RF-communication wireless communication networks, such as AT&T, Verizon, T-Mobile, and other US networks (Cellular or WLAN) via Google Maps which comes preloaded on Exhibit-B items.</p> <p>Wireless mobile communication device — including but not limited to Google’s branded devices</p> <p>such as Google Pixel 5, pixel 4a 5G, pixel 4a, pixel 4 XL, pixel 4, pixel 3a XL, pixel 3a, pixel 3 XL, pixel 3, pixel 2, pixel 2 XL, pixel XL, pixel, pixel C or other (third-parties) branded devices such as Samsung Galaxy S20 Ultra, Galaxy S20 plus, Galaxy S20, Galaxy Z fold, Galaxy S10, Galaxy A series, etc.— include radio-frequency transceivers and an associated antenna. When wireless communication device transceivers and antennas are in communication, they are coupled. Further, in addition to being so coupled, the transceiver of each is also configured for RF-communication with the wireless communication network.</p>
a first processor within the wireless mobile communications device coupled to the at least one first radio-frequency transceiver	<p>Wireless mobile communication device- including but not limited to Google’s branded devices such as Google Pixel 5, pixel 4a 5G, pixel 4a, pixel 4 XL, pixel 4, pixel 3a XL, pixel 3a, pixel 3 XL, pixel 3, pixel 2, pixel 2 XL, pixel XL, pixel, pixel C or other (third-parties) branded devices such as Samsung Galaxy S20 Ultra, Galaxy S20 plus, Galaxy S20, Galaxy Z fold, Galaxy S10, Galaxy A series, etc. (refer Exhibit B for complete list) has a processor, for example, Quad-Core/ Octa-core processor.</p> <p>Each Exhibit-B-listed mobile wireless communications device’s motherboard processor is programmed to process location-service information; i.e., to receive a location of the device from the wireless communications network (which is communicated to the device from the first RF transceiver) and generate an indication of the device’s location with respect to geographic features according to mapping information stored within the device.</p>

Exemplary Claim	Corresponding Structure in Accused Systems
	<p>For example, the motherboard processor may use Google Maps to view and find places around the globe. The processor and base station transceivers communicate by RF communication and, thus, when doing so are communicatively coupled.</p>
<p>programmed to receive a location of the wireless mobile communications device from the wireless communications network and generate an indication of a location of the wireless mobile communications device with respect to geographic features</p>	<p>Plaintiff contends the Exhibit-B-listed mobile-wireless-communications device's motherboard processor is programmed to process location-service information; i.e., to receive a location of the device from the wireless communications network and generate an indication of the device's location.</p> <p>For example, the motherboard processor may use Google Maps to obtain the device's location and provide direction from that location to a destination. Wireless mobile communication device- including but not limited to Google's branded devices such as Google Pixel 5, pixel 4a 5G, pixel 4a, pixel 4 XL, pixel 4, pixel 3a XL, pixel 3a, pixel 3 XL, pixel 3, pixel 2, pixel 2 XL, pixel XL, pixel, pixel C or other (third-parties) branded devices such as Samsung Galaxy S20 Ultra, Galaxy S20 plus, Galaxy S20, Galaxy Z fold, Galaxy S10, Galaxy A series, etc. has a processor for example, Quad-Core processor. When wireless communication device transceivers and processor are in communication, they are coupled. Further, the Location-based Service (LBS) provider, such as Google Map, on the Exhibit-B utilizes the processor coupled to the transceiver to estimates/receive the location on mobile wireless communications devices by utilizing wireless communication network or first computer.</p> <p>For example, the motherboard processor may use Google Maps to view and find places around the globe. Google map can also show your current location and provide direction (including with respect to geographic features such as nearby restaurants) from your location/source to any destination. In using Google Maps App, the mobile wireless communication device's motherboard processor generates signals for displaying on the device's screen a blue dot that shows the current location of the wireless mobile communication device. The Google map app estimates the location of the device from 3 sources: GPS (GPS uses satellites and knows your location within a few meters), Wi-Fi (the location of nearby Wi-Fi networks helps Maps know where you are), and cell towers (cell tower can be accurate up to a few thousand meters). When Google Maps isn't sure about your location, a light blue circle around the blue dot is shown. You might be anywhere within the light blue circle. The smaller the circle, the more certain the app is about your location.</p> <p>Furthermore, Google Maps App provides flexibility to download maps on SD card/internal memory of communication device examples of compatible devices is</p>

Exemplary Claim	Corresponding Structure in Accused Systems
	Samsung Galaxy S20, Pixel 4a, Pixel 4a 5G, Pixel 5, etc., and navigate offline. When internet is slow or mobile data is expensive, or communication device cannot connect to internet, an area can be saved to phone or tablet (Exhibit B) from Google maps app and use it when offline. Communication device can use Offline maps for Navigation through the downloaded area without internet.
according to mapping information stored within the wireless mobile communications device, and	<p>Plaintiff contends Google's and others mobile-wireless-communications device's motherboard processor is programmed to process location-service information; i.e., to receive a location of the device from the wireless communications network and generate an indication of the device's location.</p> <p>For example, the motherboard processor may use Google Maps to obtain the device's location and provide direction from that location to a destination. Wireless mobile communication device- including but not limited to Google's branded devices such as Google Pixel 5, pixel 4a 5G, pixel 4a, pixel 4 XL, pixel 4, pixel 3a XL, pixel 3a, pixel 3 XL, pixel 3, pixel 2, pixel 2 XL, pixel XL, pixel, pixel C or other (third-parties) branded devices such as Samsung Galaxy S20 Ultra, Galaxy S20 plus, Galaxy S20, Galaxy Z fold, Galaxy S10, Galaxy A series, etc. (refer Exhibit B for complete list) has a processor for example, Quad-Core processor. When wireless communication device transceivers and processor are in communication, they are coupled. Further, the Location-based Service (LBS) provider, such as Google Map, on the Exhibit-B utilizes the processor coupled to the transceiver to estimates/receive the location on mobile wireless communications devices by utilizing wireless communication network or first computer.</p> <p>For example, the motherboard processor may use Google Maps to view and find places around the globe. Google map can also show your current location and provide direction (including with respect to geographic features such as nearby restaurants) from your location/source to any destination. In using Google Maps App, the mobile wireless communication device's motherboard processor generates signals for displaying on the device's screen a blue dot that shows the current location of the wireless mobile communication device. The Google map app estimates the location of the device from 3 sources: GPS (GPS uses satellites and knows your location within a few meters), Wi-Fi (the location of nearby Wi-Fi networks helps Maps know where you are), and cell towers</p>

Exemplary Claim	Corresponding Structure in Accused Systems
	<p>(cell tower can be accurate up to a few thousand meters). When Google Maps isn't sure about your location, a light blue circle around the blue dot is shown. You might be anywhere within the light blue circle. The smaller the circle, the more certain the app is about your location.</p> <p>Furthermore, Plaintiff contends Google Maps App provides flexibility to download maps on SD card/internal memory of communication device examples of compatible devices is Samsung Galaxy S20, Pixel 4a, Pixel 4a 5G, Pixel 5, etc., and navigate offline. When internet is slow or mobile data is expensive, or communication device cannot connect to internet, an area can be saved to phone or tablet from Google maps app and use it when offline. Communication device can use Offline maps for Navigation through the downloaded area without internet.</p>
<p>wherein the processor displays to the user navigation information according to the location of the wireless mobile communications device with respect to the geographic features and a destination specified by the user at the wireless mobile communications device;</p>	<p>Plaintiff contends the motherboard processor (i.e., processor on the motherboard) of each wireless communication device item meets this limitation. The processor processes location-service information, including displaying user navigation information according to the device's location with regards to geographic features and a user-specified destination. For example, using Google map app for more examples of location services processed by each Exhibit-B device's motherboard processor) the device user locates the device's current location on the google map app and then provide details for a destination on the options, provided in the Google map app. The user can then navigate (i.e., the processor processes display information) in real time from current location to destination. The processor displays navigation in the Google Maps app to display turn-by-turn directions. Using the Google map app, the processor will show the directions and use real-time traffic information to find the best route to the specified destination.</p>

Exemplary Claim	Corresponding Structure in Accused Systems
<p>at least one second radio-frequency transceiver and an associated at least one second antenna of the wireless communications network to which the second radio-frequency transceiver is coupled; and</p>	<p>Plaintiff contends each Accused System includes a base station and each of which is coupled to at least one antenna. Base station includes radio-frequency transceivers designed and used for radio-frequency communication with at least one antenna. When base-station transceivers and antennas are in communication, they are coupled. Further, in addition to being so coupled, the transceivers and antenna of each Exhibit-A item are also, by placement within a base station, physically coupled.</p> <p>The cell of the wireless communications network include base stations for transmission and reception of wireless signals to and from the mobile wireless communication devices or UEs or user devices (mobile phones, laptops, tablets, PDAs etc.). These base stations are, therefore, RF transceivers. Also, these base stations are coupled with at least one antenna for the function of transmission and reception.</p>
<p>a second processor coupled to the at least one second radio-frequency transceiver programmed to determine the location of the wireless mobile communications device,</p>	<p>Plaintiff contends that Google Maps has one or more processors that determine(s) the location of wireless mobile communications devices. These processors communicatively coupled to the second RF transceiver(s) and are programmed to determine a wireless mobile communication device's location.</p> <p>Wireless mobile communications devices can, through the second RF transceiver(s), communicatively connect to and use Google Maps. Google Maps' processors can determine the device's current location and direction from that location/source to any destination. The processors are programmed to estimate the location of the device from 3 sources: GPS (GPS uses satellites and knows your location within a few meters), Wi-Fi (the location of nearby Wi-Fi networks helps Maps know where you are), and cell towers (cell tower can be accurate up to a few thousand meters).</p>
<p>wherein the second processor selectively determines the location of the wireless mobile communications</p>	<p>Plaintiff contends each wireless mobile can set preference flags that enable or disable accessibility to data relevant to the device's location by Location-Based Services (LBS) providers. Such programmability by a wireless device is at times known as a privacy setting. Further, such programmability is available by location-permission granting (wireless mobile communications device must grant permission).</p> <p>The LBS providers' processors select to determine a wireless mobile communications device's location if the preference flags applicable to that device have been set for enablement. The processors select to not determine a wireless mobile communications</p>

Exemplary Claim	Corresponding Structure in Accused Systems
device dependent on the setting of preference flags,	device's location if the preference flags applicable to that device have not been set for enablement.
wherein the second processor determines the location of the wireless mobile communications device if the preference flags are set to a state that permits tracking of the user of the wireless mobile communications device and communicates the location of the wireless mobile communications device to the first processor via the second radio-frequency transmitter, and	<p>Plaintiff contends each wireless mobile can set preference flags that enable or disable accessibility to data relevant to the device's location by Location-Based Services (LBS) providers. The LBS providers' processors select to determine a wireless mobile communications device's location if the preference flags applicable to that device have been set for enablement. The processors select to not determine a wireless mobile communications device's location if the preference flags applicable to that device have not been set for enablement.</p> <p>The Navigation hardware/software will only be able to determine and track the location of the Wireless communication device such as but not limited to including but not limited to Google's branded devices such as Google Pixel 5, pixel 4a 5G, pixel 4a, pixel 4 XL, pixel 4, pixel 3a XL, pixel 3a, pixel 3 XL, pixel 3, pixel 2, pixel 2 XL, pixel XL, pixel, pixel C or other (third-parties) branded devices such as Samsung Galaxy S20 Ultra, Galaxy S20 plus, Galaxy S20, Galaxy Z fold, Galaxy S10, Galaxy A series, etc., Plaintiff contends each wireless mobile can set preference flags that enable or disable accessibility to data relevant to the device's location by Location-Based Services (LBS) providers. Such programmability by a wireless device is at times known as a privacy setting. Further, such programmability is available by location-permission granting (wireless mobile communications device must grant permission).</p> <p>Plaintiff contends that if the preference flags are enabled (i.e., the wireless-mobile-communication device's user has granted permission), LBS-providers' processor(s) proceed with determining the device's location and, when determined, communicates that location to the first processor through the second RF transceiver (which, as discussed above, is a transceiver to which the LBS-providers' processors communicatively couple). The LBS-providers' processors are programmed to estimate the location of the device from 3 sources: GPS (GPS uses satellites and knows your location within a few meters), Wi-Fi (the location of nearby Wi-Fi networks helps Maps know where you are), and cell towers (cell tower can be accurate up to a few thousand meters).</p>

Exemplary Claim	Corresponding Structure in Accused Systems
<p>wherein the second processor does not determine and communicate the location of the wireless mobile communications device if the preference flags are set to a state that prohibits tracking of the wireless mobile communications device.</p>	<p>Plaintiff contends that if the preference flags are not enabled (i.e., the wireless-mobile-communication device's user has not granted permission), LBS provider application hardware/software, will not be able to determine and track the location of the Wireless communication device (Exhibit B) such as but not limited to Google's branded devices such as Google Pixel 5, pixel 4a 5G, pixel 4a, pixel 4 XL, pixel 4, pixel 3a XL, pixel 3a, pixel 3 XL, pixel 3, pixel 2, pixel 2 XL, pixel XL, pixel, pixel C or other (third-parties) branded devices such as Samsung Galaxy S20 Ultra, Galaxy S20 plus, Galaxy S20, Galaxy Z fold, Galaxy S10, Galaxy A series, etc.</p>

19. Defendant makes, uses, offers to sell, and/or sells within or imports into the U.S., wireless-network components and related applications and programs, and related services that use identified locations of wireless devices to provide tracking such that Defendant infringes claims 1–30 of the '388 patent, literally or under the doctrine of equivalents.

20. Defendant put the inventions claimed by the '388 Patent into service (i.e., used them); but for Defendant's actions, the claimed-inventions embodiments involving Defendant's products and services would never have been put into service. Defendant's acts

complained of herein caused those claimed-invention embodiments as a whole to perform, and Defendant obtaining monetary and commercial benefit from it.

21. Defendant has and continues to induce infringement. Defendants have actively encouraged or instructed others (e.g., its customers, such as Verizon, T-Mobile and Sprint), and continues to do so, on how to use its products and services (e.g., wireless-network components and related applications and programs that use identified locations of wireless devices to provide tracking of mobile devices) such to cause infringement claims 1–30 of the '388 patent, literally or under the doctrine of equivalents. Moreover, Defendant has known and should have known of the '388 patent, by at least by the date of the patent's issuance, or from the issuance of the '284 patent, which followed the date that the patent's underlying application was cited to Defendants by the U.S. Patent and Trademark Office during prosecution of one of Defendant's patent applications, such that Defendant knew and should have known that it was and would be inducing infringement.
22. Defendant has and continues to contributorily infringe. Defendant has actively encouraged or instructed others (e.g., its customers and/or the customers of its related companies, such as Verizon, T-Mobile and Sprint), and continues to do so, on how to use its products and services e.g., wireless-network components and related applications and programs that use identified locations of wireless devices to provide tracking of mobile devices) such as to cause infringement of one or more of claims 1–30 of the '388 patent, literally or under the doctrine of equivalents. Moreover, Defendant has known of the '388 patent and the technology underlying it from at least the date of issuance of the patent or from the issuance of the '284 patent, which followed the date that the patent's underlying application was cited to Defendants by the U.S. Patent and Trademark Office during prosecution of one of

Defendant's patent applications, such that Defendant knew and should have known that it was and would be contributorily infringing.

23. Defendants have caused and will continue to cause Traxcell damage by infringing the '388 patent.

V. INFRINGEMENT ('147 Patent (Attached as exhibit C))

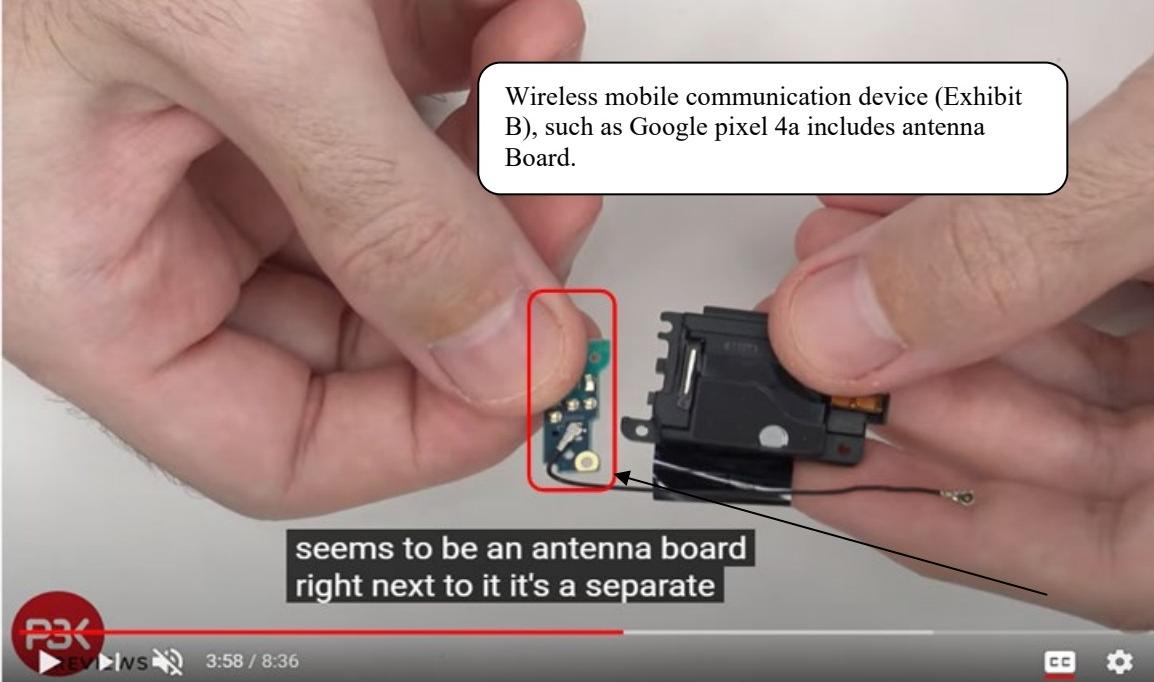
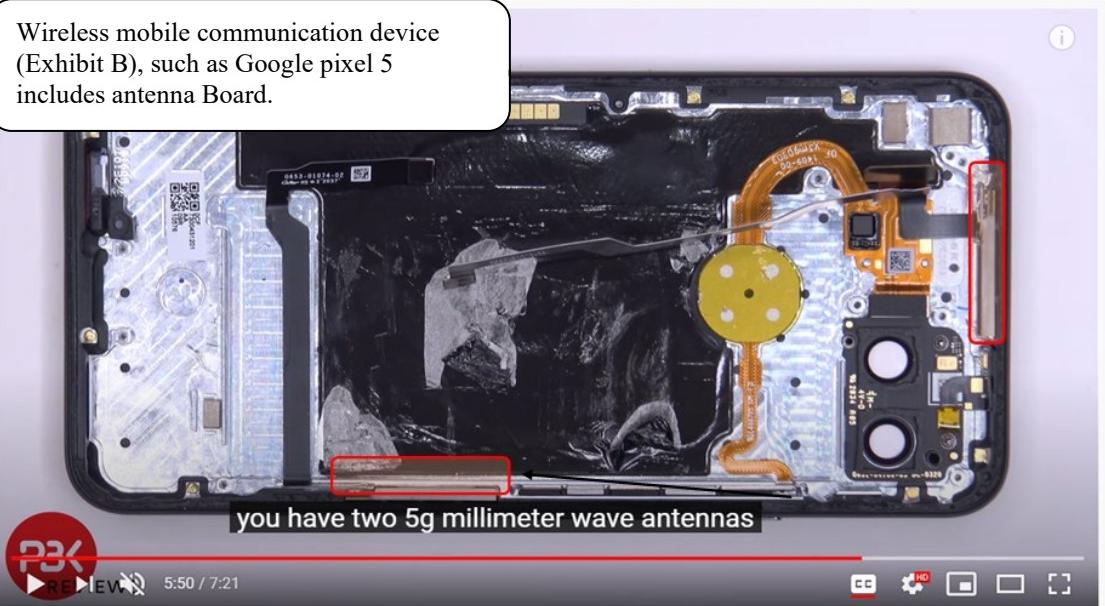
24. On October 27, 2020, U.S. Patent No. 10,820,147 ("the '147 patent") entitled "Mobile wireless device providing off-line and on-line geographic navigation information" (attached as Exhibit C) was duly and legally issued by the U.S. Patent and Trademark Office. Traxcell owns the '147 patent by assignment.

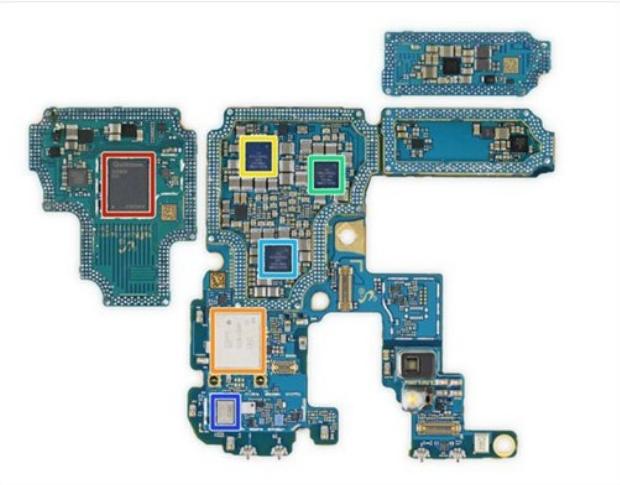
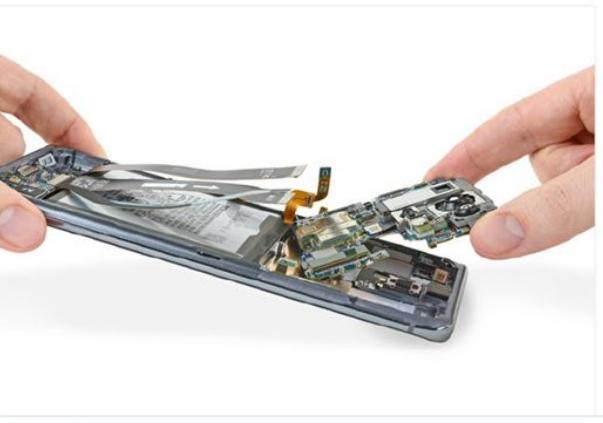
25. The '147 Patent's Abstract states, "A mobile device, wireless network and their method of operation provide both on-line (connected) navigation operation, as well as off-line navigation from a local database within the mobile device. Routing according to the navigation system can be controlled by traffic congestion measurements made by the wireless network that allow the navigation system to select the optimum route based on expected trip duration."

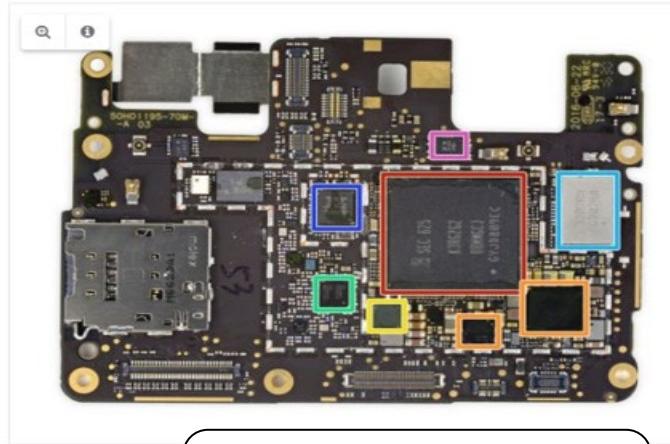
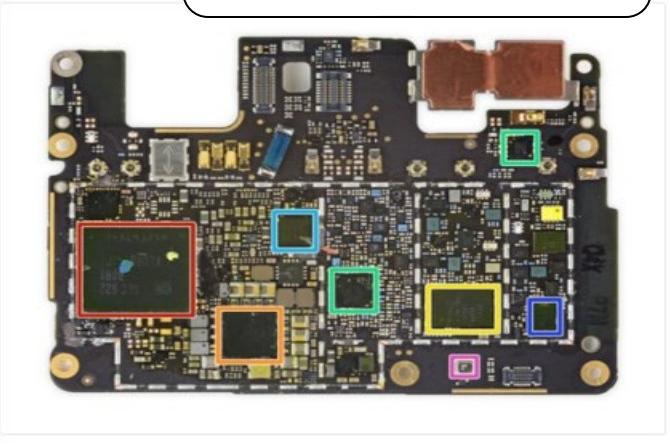
26. The following preliminary exemplary chat provides Traxcell's allegations of infringement.

Claim 1	Corresponding Structure in Accused Systems
1. A wireless communications system including:	<p>The Google Maps online navigation service and the Google Maps server-side or cloud infrastructure needed to provide the service, constitute the "Accused System".</p> <p>Each combination having at least one item listed on Exhibit A, at least one item listed on Exhibit B, and at least one item listed on Exhibit C is a wireless communications system.</p> <p>Because infringement liability is not dependent on ownership, e.g., use of a system can infringe (35 U.S.C. § 271), infringement is not dependent on ownership of all limitations of a claim.</p>
a first radio-frequency transceiver within a wireless mobile communications device and an associated first antenna to which the first radio-	<p>Plaintiff contends each item listed on Exhibit B corresponds to this claim limitation because each Exhibit-B item is a device that provides communicative access to a wireless network by transceivers designed and used for radio-frequency communication and at least one antenna. When a wireless communication device transceivers and antennas are in communication, they are coupled. Further, in addition to being so coupled, the transceiver of each Exhibit-B item is also configured for RF-communication wireless communication networks, such as AT&T, Verizon, T-Mobile, and other US networks (Cellular or WLAN) via Google Maps which comes preloaded on Exhibit-B items.</p> <p>Plaintiff contends each item listed on Exhibit B corresponds to this claim limitation because each</p>

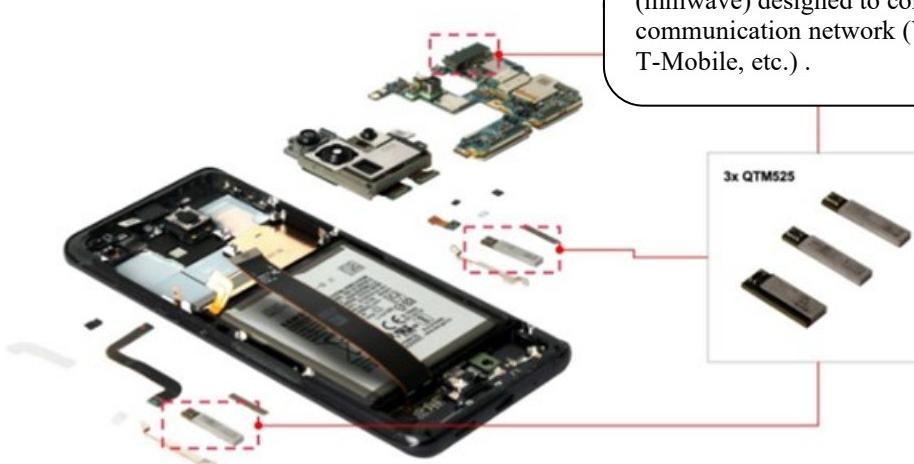
Claim 1	Corresponding Structure in Accused Systems
<p>frequency transceiver is coupled, wherein the first radio-frequency transceiver is configured for radio-frequency communication with a wireless communications network;</p>	<p>Exhibit-B item includes a radio frequency transceiver. Wireless mobile communication device — including but not limited to Google's branded devices such as Google Pixel 5, pixel 4a 5G, pixel 4a, pixel 4 XL, pixel 4, pixel 3a XL, pixel 3a, pixel 3 XL, pixel 3, pixel 2, pixel 2 XL, pixel XL, pixel, pixel C or other (third-parties) branded devices such as Samsung Galaxy S20 Ultra, Galaxy S20 plus, Galaxy S20, Galaxy Z fold, Galaxy S10, Galaxy A series, etc. (refer Exhibit B for complete list) — include radio-frequency transceivers and an associated antenna. When wireless communication device transceivers and antennas are in communication, they are coupled. Further, in addition to being so coupled, the transceiver of each Exhibit-B item is also configured for RF-communication with the wireless communication network.</p> <p>The following exemplifies this limitation's existence in Accused Systems:</p> <p>Step 37 Disconnect the antennas</p>  <ul style="list-style-type: none"> ● Use the pointed end of a spudger and pry up gently to unclip the top antenna connector from the motherboard. ● Disconnect the bottom antenna connector. <p>Attachment 1 (Google Pixel 4XL showing antenna connector) at 21.</p>

Claim 1	Corresponding Structure in Accused Systems
	 <p>Wireless mobile communication device (Exhibit B), such as Google pixel 4a includes antenna Board.</p> <p>seems to be an antenna board right next to it it's a separate</p> <p>Google Pixel 4a 5G Disassembly Teardown Repair Video Review</p> <p>3,430 views • Dec 5, 2020</p> <p>160 0 SHARE</p> <p>Source: Antenna of Google pixel 4a Teardown by PBKreviews (Time 3:58/8:36)</p> <p>Link: https://www.youtube.com/watch?v=pTPup76PxNo</p>  <p>Wireless mobile communication device (Exhibit B), such as Google pixel 5 includes antenna Board.</p> <p>you have two 5g millimeter wave antennas</p> <p>Google Pixel 5 5G Disassembly Teardown Repair Video Review. Screen Gap?</p> <p>Source: Antenna of Google pixel 5 Teardown by PBKreviews (Time-5:50/7:21)</p>

Claim 1	Corresponding Structure in Accused Systems
<p data-bbox="355 238 1034 270">Link: https://www.youtube.com/watch?v=PPvlSHyok68</p> <p data-bbox="355 340 453 371">Step 9</p> 	<ul style="list-style-type: none"> But wait! Flippin' the boards over reveals even more flippin' chips: <ul style="list-style-type: none"> Qualcomm SDR865 RF Transceiver Murata KM9D19075 Wi-Fi & Bluetooth Module Qualcomm PM8250 power management IC Qualcomm PMX55 power management IC Qualcomm PM8150C power management IC Qualcomm QDM4870 front-end module <p>Wireless mobile communication device (Exhibit B) such as Samsung Galaxy S20 includes RF transceiver.</p>
<p data-bbox="355 1058 1514 1089">Attachment 2 (Teardown of Samsung Galaxy S20 showing RF Transceiver component) at 8.</p> <p data-bbox="355 1205 453 1237">Step 5</p>  <div data-bbox="372 1685 1013 1755"> <p>TOOL USED ON THIS STEP: Manta Driver Kit - 112 Bit Driver Kit</p> <p>\$64.99</p> </div>	 <ul style="list-style-type: none"> We continue to raid the toolbag for bigger and beefier tools—like this Manta kit driver, which works equally well for swatting away screws and smashing walnuts. Just don't mix them up. These screws are all named Phillip. We like Phillip; it's a solid name for a screw. With the top layer of antennas, speaker, and charge coils flipped aside, we get a clear look at the internals. It does look a lot like a Note10+ 5G in there, if you eliminated the stylus and used that space for more battery. Stay tuned for our teardown wallpaper post! We'll have your Ultra wallpapers, as well as your Plus and your standard S20. We waste no time extracting the main board, which comes so laden with cameras, millimeter-wave hardware, and extra board layers that it feels like only half a victory. Time to start chucking things over-board. <p>Wireless mobile communication device (Exhibit B), such as Samsung Galaxy S20 includes antenna cables.</p>

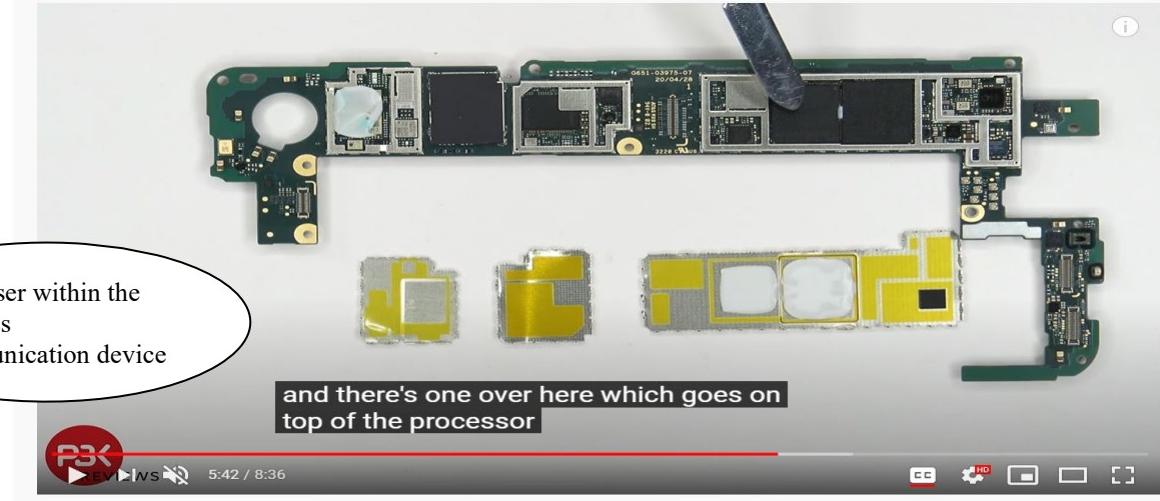
Claim 1	Corresponding Structure in Accused Systems
	<p data-bbox="355 238 1351 270">Attachment 2 (ifixit Teardown of Samsung Galaxy S20 showing antenna) at 05.</p> <p data-bbox="376 439 483 466">Step 10</p>  <p data-bbox="577 931 953 1022">Wireless mobile communication device (Exhibit B) such as Google Pixel includes RF transceiver.</p> <ul style="list-style-type: none"> ● Chips on the front of the motherboard: <ul style="list-style-type: none"> ● Samsung K3RG2G20BM-MGCJ 4 GB LPDDR4 mobile DRAM with a quad-core Qualcomm Snapdragon 821 processor layered underneath (two cores clocked at 2.15 GHz and two cores clocked at 1.6 Ghz) ● Qualcomm PMI8996 power management IC, and Qualcomm SMB1350 Quick Charge 3.0 IC ● NXP TFA9891 smart audio amplifier ● Qualcomm WTR4905 LTE RF transceiver ● 3207RA G707A (looks like Wi-Fi) ● NXP 55102 1807 S0622 (likely NFC controller) ● Bosch Sensortec BMI160 low power IMU <p data-bbox="372 1001 470 1028">Step 11</p>  <ul style="list-style-type: none"> ● And on the back: <ul style="list-style-type: none"> ● Samsung KLUBG4G1CE-B0B1 32 GB Universal Flash Storage (UFS) 2.0 ● Qualcomm PM8996 Power Management IC ● Avago ACPM-7800 power amplifier ● Qualcomm WTR3925 LTE RF transceiver, and Qualcomm RF360 Dynamic Antenna Matching Tuner (QFE2550) ● Qualcomm WCD9335 audio codec ● Skyworks SKY77807 Quad-Band Power Amplifier Module (PAM) ● Bosch Sensortec BMP280-series barometric pressure sensor <p data-bbox="355 1522 1307 1554">Attachment 13 (Google Pixel showing RF Transceiver component) at 9&10.</p>

Claim 1	Corresponding Structure in Accused Systems
	<p>While the 1st Gen 5G smartphone supported only single or dual band 5G, the 2nd Gen designs like the Samsung Galaxy S20 now support much more. The Galaxy S20 Ultra under review here is model number SM-G988U1 for the North American market which supports low band FDD 5G like n5 (850MHz) and n71 (600MHz) as well as mid-to-high bands like n2, n41 and n66. For 5G global roaming, the Galaxy S20 Ultra also included the common Ultra-High Frequency (UHF) 5G band n78. Further, the Galaxy S20 Ultra has millimeter wave (mmWave) antenna modules in addition to the Sub-6GHz RFFE. The new Qualcomm QTM0525 antenna modules in the Galaxy S20 Ultra support an additional four ultra-wide 5G bands (n258, n257, n260 and n261). So how do all these RF capabilities come together inside the Galaxy S20? Let's dive in for a closer look.</p> <p>5g-modem-to-rf-integration-rf</p> <p>Wireless mobile communication device (Exhibit B) such as Samsung Galaxy S20 Ultra includes RF transceiver.</p> <p>Attachment 3 (RF-Transceiver and antenna of Galaxy S20 device coupled with communication network) at 7.</p>

Claim 1	Corresponding Structure in Accused Systems
	<p>The first 5G devices in the US were based on mmWave technology. The 1st generation 5G devices were either using Qualcomm's mmWave antenna module design for mmWave networks (Verizon, AT&T, T-Mobile) or a more conventional RFFE design for sub-6 GHz 5G networks (Sprint). However, that represented a design compromise since each variant would be shut out from other 5G network. With the 2nd Gen 5G designs like the Galaxy S20 Ultra, OEMs are adding mmWave capabilities along with Sub-6 GHz 5G RFFE on the same device. This dual RFFE design allows flagship devices to be network agnostic, opening up many more 5G network and also benefits Samsung by reducing 5G SKUs.</p> <p>5g-modem-to-rf-integration-mmwave</p>  <p>Wireless mobile communication device (Exhibit B) such as Samsung Galaxy S20 Ultra includes RF transceiver antenna (mmwave) designed to connect wireless communication network (Verizon, AT&T, T-Mobile, etc.).</p> <p>3x QTM525</p> <p>Attachment 3 (RF-Transceiver and antenna of Galaxy S20 device coupled with communication network) at 10.</p>

Claim 1	Corresponding Structure in Accused Systems
<p>Change mobile network settings</p> <ol style="list-style-type: none"> 1. Open your phone's Settings app. 2. Tap Network & internet > Mobile network. 3. Tap a setting. <p>Tip: To reset all your network settings, in your phone's Settings app, tap System > Advanced > Reset options > Reset Wi-Fi, mobile & Bluetooth.</p> <p>Available mobile network settings</p> <p>The following options vary by phone and Android version:</p> <ul style="list-style-type: none"> • Mobile data: Turn mobile data on or off. • Roaming: Let your phone send data over other carriers' networks when your carrier's networks. • App data usage: Learn how to check app usage of your mobile data. • Data warning & limit: Learn how to reduce mobile data use. • Preferred network type: Pick your preferred network type from options, like 5G and LTE. Learn more about 5G on Pixel phones. • Network: Pick your network operator from available networks. • Access point names: Help your carrier find the right IP address for your phone and connect your phone securely. 	<p>Wireless mobile communication device (Exhibit B) able to connect to a wireless communication network</p> <p>Attachment 14 (Method to connect a wireless communication network via Google pixel 4a device) at 1.</p> <p>Apps</p> <p> Google Pay Pay with your Android phone at participating stores and within mobile apps with Google Pay™. Visit support.google.com/pay to learn more.</p> <p> Google Maps preloaded in the Wireless mobile communication devices (Exhibit B), Such as Galaxy S20, Pixel 4a, Pixel 4a 5G, Pixel 5</p> <p>Get directions and other location-based information. You must enable location services to use Google Maps. For more information, see Location. Visit support.google.com/maps to learn more.</p> <p>Attachment 15 (Google Maps application preloaded on Samsung Galaxy S20) at 113.</p>

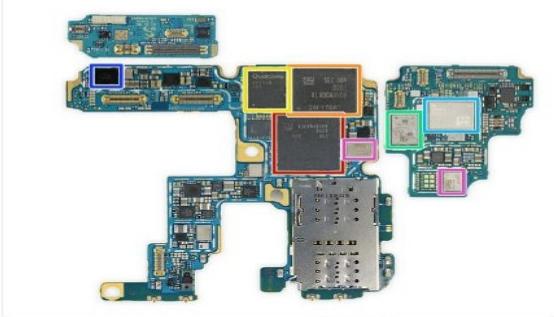
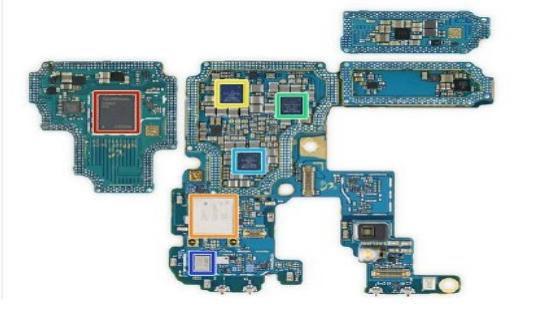
Claim 1	Corresponding Structure in Accused Systems
	 <p>FULL OR DIFFERENCES <small>Change compare mode</small></p>
	<p>Attachment 4 (Google Maps application preloaded on Pixel 4a, Pixel 4a 5G, and Pixel 5) at 1.</p> <p>Wireless mobile communication device (Exhibit B) able to connect to a wireless communication network</p> <p>Network⁸</p> <ul style="list-style-type: none"> LTE: Up to 4CC (12 layers) DL & 2CC UL⁹ <p>5G Sub-6¹⁰</p> <ul style="list-style-type: none"> TDD: Up to 1CC x 100 MHz 4x4 MIMO DL & 1CC x 100 MHz UL FDD: Up to 1CC x 20 MHz 4x4 MIMO DL & 1CC x 20 MHz UL⁹ <p>5G mmWave [US only]^{10, 11}</p> <ul style="list-style-type: none"> TDD: Up to 4CC x 100 MHz 2x2 MIMO DL & 1CC x 100 MHz 2x2 M <p>[US / FI / CA / TW] Model G025E</p> <ul style="list-style-type: none"> GSM/EDGE: Quad-band (850, 900, 1800, 1900 MHz) UMTS/HSPA+/HSDPA: Bands 1/2/4/5/8 CDMA EVDO Rev A: BC0/BC1/BC10 LTE: Bands B1/2/3/4/5/7/8/12/13/14/17/18/19/20/25/26/28/29, 30/32/38/39/40/41/42/46/48/66/71 5G Sub-6: Bands n1/2/5/12/25/28/41/66/71/78 eSIM <p>[Verizon] Model G6QU3</p> <ul style="list-style-type: none"> GSM/EDGE: Quad-band (850, 900, 1800, 1900 MHz) UMTS/HSPA+/HSDPA: Bands 1/2/4/5/8 CDMA EVDO Rev A: BC0/BC1/BC10 LTE: Bands B1/2/3/4/5/7/8/12/13/14/17/18/19/20/25/26/28/29, 30/32/38/39/40/41/42/46/48/66/71 5G Sub-6: Bands n2/5/12/25/66/71 5G mmWave: Bands n260/261 eSIM <p>Attachment 7 (Pixel phone hardware tech specs) at 6.</p>

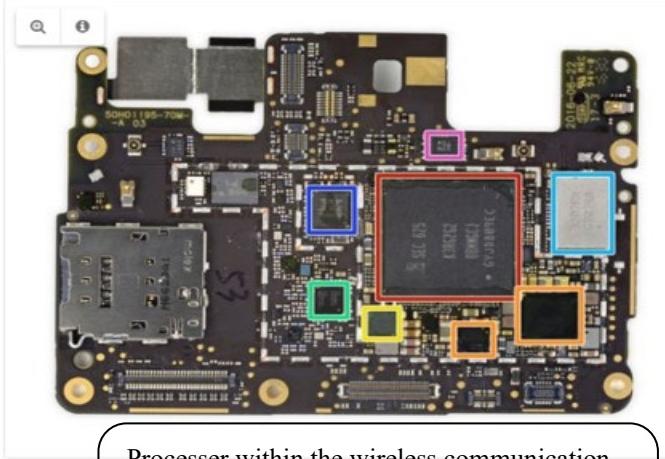
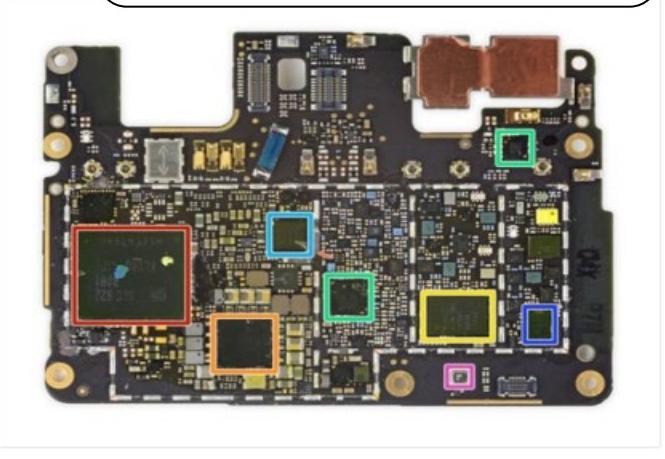
Claim 1	Corresponding Structure in Accused Systems		
a first processor within the wireless mobile communications device coupled to the at least one first radio-frequency transceiver	<p>Plaintiff contends each item listed on Exhibit B corresponds to this claim limitation because each Exhibit-B item includes a processor. Wireless mobile communication device- including but not limited to Google's branded devices such as Google Pixel 5, pixel 4a 5G, pixel 4a, pixel 4 XL, pixel 4, pixel 3a XL, pixel 3a, pixel 3 XL, pixel 3, pixel 2, pixel 2 XL, pixel XL, pixel, pixel C or other (third-parties) branded devices such as Samsung Galaxy S20 Ultra, Galaxy S20 plus, Galaxy S20, Galaxy Z fold, Galaxy S10, Galaxy A series, etc. (refer Exhibit B for complete list) has a processor, for example, Quad-Core/ Octa-core processor.</p> <p>Each Exhibit-B-listed mobile wireless communications device's motherboard processor is programmed to process location-service information; i.e., to receive a location of the device from the wireless communications network (which is communicated to the device from the first RF transceiver) and generate an indication of the device's location with respect to geographic features according to mapping information stored within the device. For example, the motherboard processor may use Google Maps to view and find places around the globe. The processor and base station transceivers communicate by RF communication and, thus, when doing so are communicatively coupled.</p> <p>The following exemplifies the existence of this limitation in Accused Systems:</p>  <p>Processor within the wireless communication device</p> <p>and there's one over here which goes on top of the processor</p> <p>Google Pixel 4a 5G Disassembly Teardown Repair Video Review</p> <p>Source: Processor of Google pixel 4a Teardown by PBKreviews (Time-5:42/8:36)</p> <p>Link: https://www.youtube.com/watch?v=pTPup76PxNo&ab_channel=PBKreviews</p> <table border="1"> <tr> <td>Processors</td> <td> <ul style="list-style-type: none"> Qualcomm®⁵ Snapdragon™ 765G 2.4 GHz + 2.2 GHz + 1.8 GHz, 64-bit Octa-Core Adreno 620 Titan™ M Security Module </td> </tr> </table> <p>Attachment 7 (Specifications of Google pixel 5) at 1.</p> <p>Processor within the wireless communication device (Exhibit B).</p>	Processors	<ul style="list-style-type: none"> Qualcomm®⁵ Snapdragon™ 765G 2.4 GHz + 2.2 GHz + 1.8 GHz, 64-bit Octa-Core Adreno 620 Titan™ M Security Module
Processors	<ul style="list-style-type: none"> Qualcomm®⁵ Snapdragon™ 765G 2.4 GHz + 2.2 GHz + 1.8 GHz, 64-bit Octa-Core Adreno 620 Titan™ M Security Module 		

Claim 1	Corresponding Structure in Accused Systems				
	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 5px; width: 15%;">Wireless and Location</td><td style="padding: 5px;"> <ul style="list-style-type: none"> • Wi-Fi 2.4 GHz + 5 GHz 802.11a/b/g/n/ac 2x2 MIMO • Bluetooth®¹⁰ 5.0 + LE, A2DP (HD codecs: AptX, AptX HD, LDAC, AAC) • NFC • Google Cast • Dual band (L1 + L5) and (E1 + E5a) <p>[US]</p> <ul style="list-style-type: none"> • GPS, GLONASS, Galileo, QZSS <p>[ROW]</p> <ul style="list-style-type: none"> • GPS, GLONASS, Galileo, QZSS, BeiDou </td></tr> <tr> <td style="padding: 5px;">Network¹¹</td><td style="padding: 5px;"> <ul style="list-style-type: none"> • LTE: Up to 4CC (12 layers) DL & 2CC UL¹² 5G Sub-6¹³ • TDD: Up to 1CC x 100 MHz 4x4 MIMO DL & 1CC x 100 MHz UL • FDD: Up to 1CC x 20 MHz 4x4 MIMO DL & 1CC x 20 MHz UL¹² <p>5G mmWave [US only]¹³</p> <ul style="list-style-type: none"> • TDD: Up to 4CC x 100 MHz 2x2 MIMO DL & 1CC x 100 MHz 2x2 MIMO UL¹² <p>[US / FI] Model GD1YQ</p> <ul style="list-style-type: none"> • GSM/EDGE: Quad-band (850, 900, 1800, 1900 MHz) • UMTS/HSPA+/HSDPA: Bands 1,2,4,5,6,8,19 • CDMA EVDO Rev A: BC0/BC1/BC10 • LTE: Bands B1/2/3/4/5/7/8/12/13/14/17/18/19/20/25/26/28/29/30/32/38/39/40/41/42/46/48/66/71/77/78 • 5G Sub-6: Bands n1/2/3/5/7/8/12/28/41/66/71/77/78 • 5G mmWave: Bands n260/n261 • eSIM </td></tr> </table>	Wireless and Location	<ul style="list-style-type: none"> • Wi-Fi 2.4 GHz + 5 GHz 802.11a/b/g/n/ac 2x2 MIMO • Bluetooth®¹⁰ 5.0 + LE, A2DP (HD codecs: AptX, AptX HD, LDAC, AAC) • NFC • Google Cast • Dual band (L1 + L5) and (E1 + E5a) <p>[US]</p> <ul style="list-style-type: none"> • GPS, GLONASS, Galileo, QZSS <p>[ROW]</p> <ul style="list-style-type: none"> • GPS, GLONASS, Galileo, QZSS, BeiDou 	Network¹¹	<ul style="list-style-type: none"> • LTE: Up to 4CC (12 layers) DL & 2CC UL¹² 5G Sub-6¹³ • TDD: Up to 1CC x 100 MHz 4x4 MIMO DL & 1CC x 100 MHz UL • FDD: Up to 1CC x 20 MHz 4x4 MIMO DL & 1CC x 20 MHz UL¹² <p>5G mmWave [US only]¹³</p> <ul style="list-style-type: none"> • TDD: Up to 4CC x 100 MHz 2x2 MIMO DL & 1CC x 100 MHz 2x2 MIMO UL¹² <p>[US / FI] Model GD1YQ</p> <ul style="list-style-type: none"> • GSM/EDGE: Quad-band (850, 900, 1800, 1900 MHz) • UMTS/HSPA+/HSDPA: Bands 1,2,4,5,6,8,19 • CDMA EVDO Rev A: BC0/BC1/BC10 • LTE: Bands B1/2/3/4/5/7/8/12/13/14/17/18/19/20/25/26/28/29/30/32/38/39/40/41/42/46/48/66/71/77/78 • 5G Sub-6: Bands n1/2/3/5/7/8/12/28/41/66/71/77/78 • 5G mmWave: Bands n260/n261 • eSIM
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Attachment 7 (Specifications of Google pixel 5) at 2.

Claim 1	Corresponding Structure in Accused Systems																																																																													
<p>Processor within the wireless communication device (Exhibit B), such as Google Pixel 4a, Pixel 4a 5G and Pixel 5</p>	<p>FULL OR DIFFERENCES <small>Change compare mode</small></p>	<p>Google Pixel 4a REVIEW SPECIFICATIONS READ OPINIONS PICTURES 128GB 6GB RAM ALL PRICES</p>	<p>Google Pixel 4a 5G PREVIEW SPECIFICATIONS READ OPINIONS PICTURES 128GB 6GB RAM ALL PRICES</p>	<p>Google Pixel 5 REVIEW SPECIFICATIONS READ OPINIONS PICTURES 128GB 8GB RAM ALL PRICES</p>																																																																										
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Claim 1	Corresponding Structure in Accused Systems
<p data-bbox="372 236 447 261">Step 8</p>  <p data-bbox="372 756 447 781">Step 9</p> 	<p data-bbox="992 291 1377 333">With all shields down, we can get a better look at the silicon hiding beneath:</p> <ul style="list-style-type: none"> <li data-bbox="1024 344 1377 386">● Samsung K3LK4K40BM-BGCN 12 GB LPDDR5 RAM layered over Qualcomm 865 SoC <li data-bbox="1024 407 1377 449">● Samsung KLUDG4UHDB-B2D1 128 GB UFS 3.0 flash storage <li data-bbox="1024 470 1377 492">● Qualcomm SDX55M 2nd-gen 5G modem <li data-bbox="1024 513 1377 534">● Skyworks SKY58210-11 RF Front-End Module <li data-bbox="1024 555 1377 576">● Qorvo QM78092 Front-End Module <li data-bbox="1024 597 1377 618">● Maxim MAX77705C power management IC <li data-bbox="1024 639 1377 661">● Qualcomm QPM5677 and QPM6585 5G power amplification modules <p data-bbox="1241 677 1377 699">Add a comment</p> <p data-bbox="502 650 943 762">Processor within the wireless communication device (Exhibit B), such as Samsung Galaxy S20 coupled with RF transceiver and Wi-Fi Module</p> <ul style="list-style-type: none"> <li data-bbox="992 819 1377 861">● But wait! Flippin' the boards over reveals even more flippin' chips: <li data-bbox="1024 872 1377 914">● Qualcomm SDR865 RF Transceiver <li data-bbox="1024 914 1377 956">● Murata KM9D19075 Wi-Fi & Bluetooth Module <li data-bbox="1024 956 1377 998">● Qualcomm PM8250 power management IC <li data-bbox="1024 998 1377 1041">● Qualcomm PMX55 power management IC <li data-bbox="1024 1041 1377 1083">● Qualcomm PM8150C power management IC <li data-bbox="1024 1083 1377 1125">● Qualcomm QDM4870 front-end module
Attachment 2 (Teardown of Samsung Galaxy S20 showing RF Transceiver component) at 8.	

Claim 1	Corresponding Structure in Accused Systems
<p>Step 10</p>  <p>Processor within the wireless communication device (Exhibit B), such as Google pixel coupled with RF transceiver and Wi-Fi Module</p>	<ul style="list-style-type: none"> Chips on the front of the motherboard: <ul style="list-style-type: none"> Samsung K3RG2G20BM-MGCJ 4 GB LPDDR4 mobile DRAM with a quad-core Qualcomm Snapdragon 821 processor layered underneath (two cores clocked at 2.15 GHz and two cores clocked at 1.6 GHz) Qualcomm PMI8996 power management IC, and Qualcomm SMB1350 Quick Charge 3.0 IC NXP TFA9891 smart audio amplifier Qualcomm WTR4905 LTE RF transceiver 3207RA G707A (looks like Wi-Fi) NXP 55102 1807 S0622 (likely NFC controller) Bosch Sensortec BMI160 low power IMU
<p>Step 11</p> 	<ul style="list-style-type: none"> And on the back: <ul style="list-style-type: none"> Samsung KLUBG4G1CE-B0B1 32 GB Universal Flash Storage (UFS) 2.0 Qualcomm PM8996 Power Management IC Avago ACPM-7800 power amplifier Qualcomm WTR3925 LTE RF transceiver, and Qualcomm RF360 Dynamic Antenna Matching Tuner (QFE2550) Qualcomm WCD9335 audio codec Skyworks SKY77807 Quad-Band Power Amplifier Module (PAM) Bosch Sensortec BMP280-series barometric pressure sensor
<p>programmed to receive information indicative of a location of the wireless mobile communications device and generate an indication of a location of the wireless mobile communications device with respect to geographic</p>	<p>Attachment 13 (Google Pixel showing RF Transceiver component) at 9&10.</p> <p>Plaintiff contends the Exhibit-B-listed mobile-wireless-communications device's motherboard processor is programmed to process location-service information; i.e., to receive a location of the device from the wireless communications network and generate an indication of the device's location.</p> <p>For example, the motherboard processor may use Google Maps to obtain the device's location and provide direction from that location to a destination. Wireless mobile communication device-including but not limited to Google's branded devices such as Google Pixel 5, pixel 4a 5G, pixel 4a, pixel 4 XL, pixel 4, pixel 3a XL, pixel 3a, pixel 3 XL, pixel 3, pixel 2, pixel 2 XL, pixel XL, pixel, pixel C or other (third-parties) branded devices such as Samsung Galaxy S20 Ultra, Galaxy S20 plus, Galaxy S20, Galaxy Z fold, Galaxy S10, Galaxy A series, etc. (refer Exhibit B for complete list) has a processor for example, Quad-Core processor. When wireless communication device transceivers and processor are in communication, they are coupled. Further, the Location-based Service (LBS) provider, such as Google Map, on the Exhibit-B utilizes the processor coupled to the transceiver to estimates/receive the location on mobile wireless communications devices (specifically one or more of the mobile wireless communications devices identified on</p>

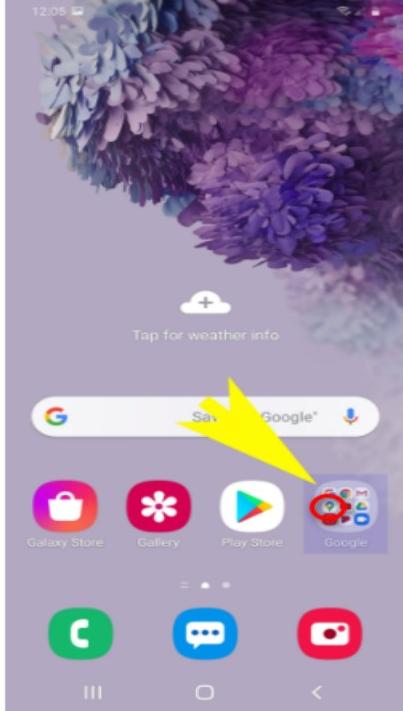
Claim 1	Corresponding Structure in Accused Systems
features	<p>Exhibit B) by utilizing wireless communication network or first computer.</p> <p>For example, the motherboard processor may use Google Maps to view and find places around the globe. Google map can also show your current location and provide direction (including with respect to geographic features such as nearby restaurants) from your location/source to any destination. In using Google Maps App, the mobile wireless communication device's motherboard processor generates signals for displaying on the device's screen a blue dot that shows the current location of the wireless mobile communication device. The Google map app estimates the location of the device from 3 sources: GPS (GPS uses satellites and knows your location within a few meters), Wi-Fi (the location of nearby Wi-Fi networks helps Maps know where you are), and cell towers (cell tower can be accurate up to a few thousand meters). When Google Maps isn't sure about your location, a light blue circle around the blue dot is shown. You might be anywhere within the light blue circle. The smaller the circle, the more certain the app is about your location.</p> <p>Furthermore, Google Maps App provides flexibility to download maps on SD card/internal memory of communication device (Exhibit B) examples of compatible devices is Samsung Galaxy S20, Pixel 4a, Pixel 4a 5G, Pixel 5, etc., and navigate offline. When internet is slow or mobile data is expensive, or communication device cannot connect to internet, an area can be saved to phone or tablet (Exhibit B) from Google maps app and use it when offline. Communication device can use Offline maps for Navigation through the downloaded area without internet.</p> <p>The following exemplifies the existence of this limitation in Accused Systems:</p>

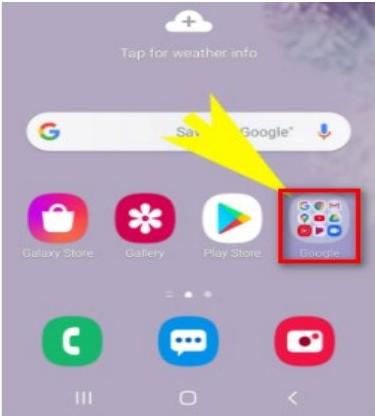
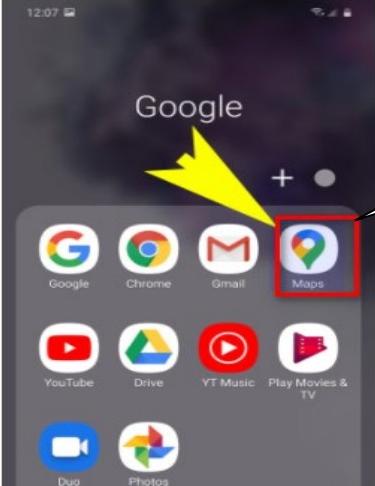
Claim 1	Corresponding Structure in Accused Systems			
				
FULL OR DIFFERENCES				
	<i>Change compare mode</i>	128GB 6GB RAM	128GB 6GB RAM	128GB 8GB RAM
NETWORK				
LAUNCH	Technology	GSM / HSPA / LTE	GSM / HSPA / LTE / 5G	GSM / CDMA / HSPA / EVDO / LTE / 5G
BODY	Announced Status	2020, August 03 Available. Released 2020, August 20	2020, September 30 Available. Released 2020, November 05	2020, September 30 Available. Released 2020, October 15
	Dimensions	144 x 69.4 x 8.2 mm (5.67 x 2.73 x 0.32 in)	153.9 x 74 x 8.2 mm (Sub-6) or 8.5 mm (Sub-6 and mmWave)	144.7 x 70.4 x 8 mm (5.70 x 2.77 x 0.31 in)
	Weight	143 g (5.04 oz)	168 g (5G Sub-6); 171 g (5G Sub-6 and mmWave) (5.93 oz)	151 g (5.33 oz)
	Build	Glass front (Gorilla Glass 3), plastic back, plastic frame	Glass front (Gorilla Glass 3), plastic back, plastic frame	Glass front (Gorilla Glass 6), aluminum back, aluminum frame
	SIM	Nano-SIM and/or eSIM	Nano-SIM and/or eSIM	Nano-SIM and/or eSIM IP68 dust/water resistant (up to 1.5m for 30 mins)
DISPLAY				
	Type	OLED, HDR	OLED, HDR	OLED, 90Hz, HDR10+
	Size	5.81 inches, 83.2 cm ² (~83.3% screen-to-body ratio)	6.2 inches, 95.7 cm ² (~84.1% screen-to-body ratio)	6.0 inches, 87.6 cm ² (~85.9% screen-to-body ratio)
	Resolution	1080 x 2340 pixels, 19.5:9 ratio (~443 ppi density)	1080 x 2340 pixels, 19.5:9 ratio (~413 ppi density)	1080 x 2340 pixels, 19.5:9 ratio (~432 ppi density)
	Protection	Corning Gorilla Glass 3 Always-on display	Corning Gorilla Glass 3 Always-on display	Corning Gorilla Glass 6 Always-on display
PLATFORM				
	OS	Android 10, upgradable to Android 11	Android 11	Android 11
	Chipset	Qualcomm SDM730 Snapdragon 730G (8 nm)	Qualcomm SM7250 Snapdragon 765G (7 nm)	Qualcomm SM7250 Snapdragon 765G (7 nm)
	CPU	Octa-core (2x2.2 GHz Kryo 470 Gold & 6x1.8 GHz Kryo 470 Silver)	Octa-core (1x2.4 GHz Kryo 475 Prime & 1x2.2 GHz Kryo 475 Gold & 6x1.8 GHz Kryo 475 Silver)	Octa-core (1x2.4 GHz Kryo 475 Prime & 1x2.2 GHz Kryo 475 Gold & 6x1.8 GHz Kryo 475 Silver)
	GPU	Adreno 618	Adreno 620	Adreno 620

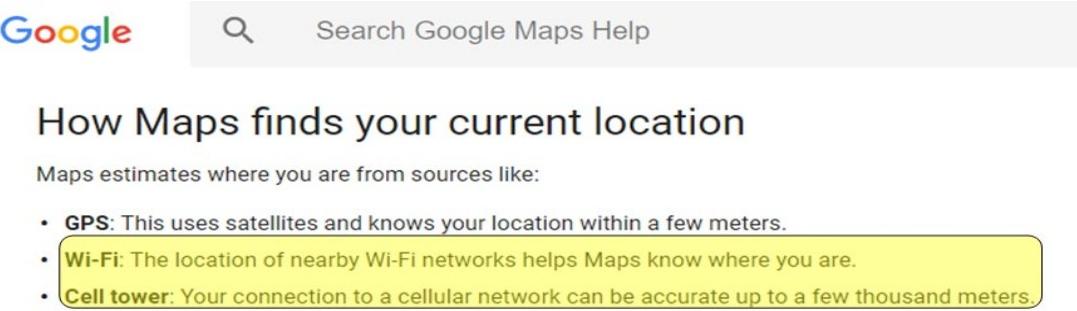
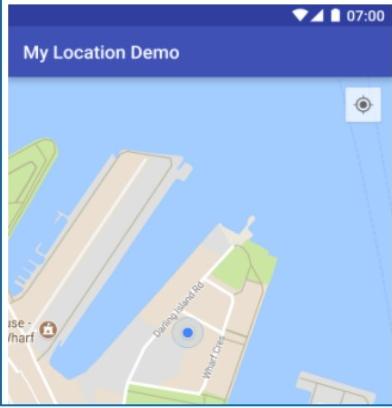
Attachment 4 (Processor of Google Pixel 4a, Pixel 4a 5G and Pixel 5) at 1.

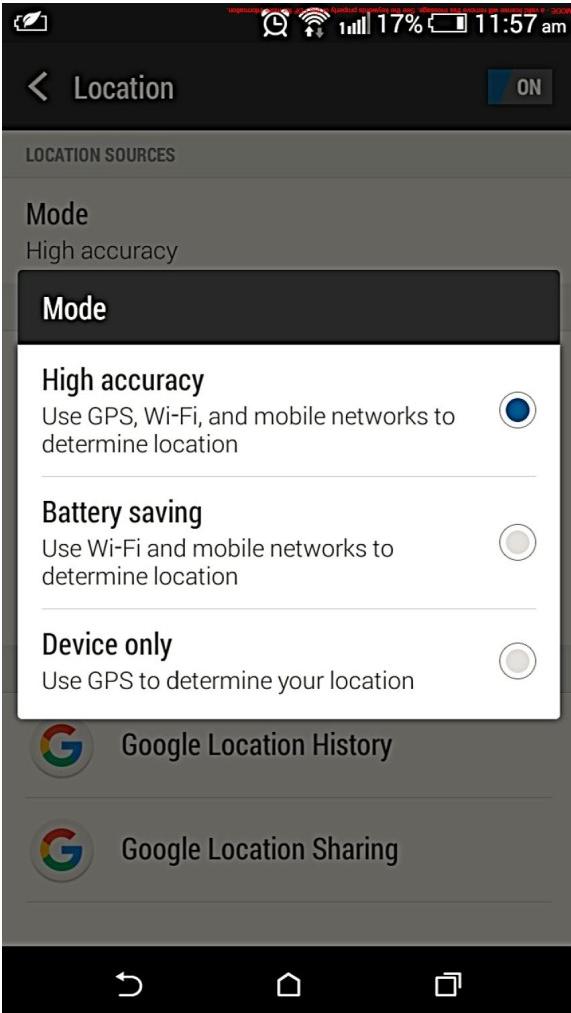
Claim 1	Corresponding Structure in Accused Systems
<p data-bbox="372 234 453 261">Step 8</p>	<ul style="list-style-type: none"> With all shields down, we can get a better look at the silicon hiding beneath: <ul style="list-style-type: none"> Samsung K3LK4K40BM-BGCN 12 GB LPDDR5 RAM layered over Qualcomm 865 SoC Samsung KLUDG4UHDB-B2D1 128 GB UFS 3.0 flash storage Qualcomm SDX55M 2nd-gen 5G modem Skyworks SKY58210-11 RF Front-End Module Qorvo QM78092 Front-End Module Maxim MAX77705C power management IC Qualcomm QPM5677 and QPM6585 5G power amplification modules <p style="text-align: right;"> Add a comment</p>
<p data-bbox="372 798 453 825">Step 9</p>	<ul style="list-style-type: none"> But wait! Flippin' the boards over reveals even more flippin' chips: <ul style="list-style-type: none"> Qualcomm SDR865 RF Transceiver Murata KM9D19075 Wi-Fi & Bluetooth Module Qualcomm PM8250 power management IC Qualcomm PMX55 power management IC Qualcomm PM8150C power management IC Qualcomm QDM4870 front-end module

Attachment 2 (RF Transceiver and Processor of Samsung Galaxy S20) at 8.

Claim 1	Corresponding Structure in Accused Systems
	<p>Using Turn-by-Turn Navigation with the Galaxy S20 Google Maps</p> <p>Time Needed : 8 minutes</p> <p>The following steps demonstrate the actual process of setting up and utilizing turn-by-turn navigation system with the Google Maps app on the new Samsung Galaxy S20 handset.</p> <p>Before you begin, verify and ensure that location is enabled on your phone. It has to be enabled so that your device can determine your current location.</p> <p>1. Tap to open the Google folder from the Home screen. A new screen consisting of Google-related apps and services will be displayed.</p>  <div data-bbox="889 686 1476 834" style="border: 1px solid black; padding: 5px;"> <p>Google Maps preloaded in the Wireless mobile communication devices (Exhibit B), such as Galaxy S20. Current location of the device is determined if location is enabled</p> </div> <p>Attachment 5 (how to use turn by turn Google map) at 1.</p>

Claim 1	Corresponding Structure in Accused Systems
	 <p>2. Tap Maps to open Google Maps app. If this is the first time you use Google Maps on your Galaxy S20, you'll be prompted with a Welcome screen. If you see this screen, read and review the information then tap GOT IT to proceed.</p>  <p>Google Maps preloaded in the Wireless mobile communication devices (Exhibit B), such as Galaxy S20.</p> <p>Attachment 5 (how to use turn by turn google map) at 2&3.</p> <div data-bbox="381 1353 654 1431">  </div> <div data-bbox="1171 1360 1462 1417"> Personal Business Shop Why Verizon Support </div> <p>Home > Support > Sony > Sony Xperia Z2 > Google Maps - Find Current Location</p> <h2>Google Maps™ - Find Current Location</h2> <p>Notes:</p> <ul style="list-style-type: none"> If the Google Maps app isn't already installed on your device, it can be downloaded from the Google Play Store™. For further assistance, refer to the Google Maps Help Center. <ol style="list-style-type: none"> From a Home screen, tap Apps. Tap Maps. Tap the My Location icon (located in the lower-right). <p>Wireless communication network (e.g. Verizon, AT&T, T-Mobile, etc.) used to estimate the location of the Wireless communication device (Exhibit B) on Google Maps.</p>

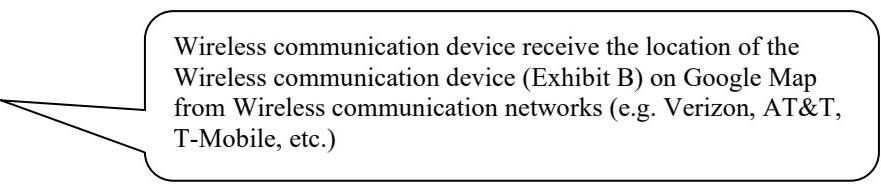
Claim 1	Corresponding Structure in Accused Systems
	<p>Attachment 6 (Find Current Location on Google map) at 1.</p>  <p>Maps estimates where you are from sources like:</p> <ul style="list-style-type: none"> • GPS: This uses satellites and knows your location within a few meters. • Wi-Fi: The location of nearby Wi-Fi networks helps Maps know where you are. • Cell tower: Your connection to a cellular network can be accurate up to a few thousand meters.
	<p>Attachment 8 (How map finds your current location) at 2.</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>What the blue dot means</p> <p>The blue dot shows you where you are on the map. When Google Maps isn't sure about your location, you'll see a light blue circle around the blue dot. You might be anywhere within the light blue circle. The smaller the circle, the more certain the app is about your location.</p> <p>Notes:</p> <ul style="list-style-type: none"> • If the blue dot is not showing, or the dot is gray, this means that we can't find your current location and we're showing you the last location you visited. • If there's something between you and cell towers, like a parking garage or tall buildings, your blue dot might not be accurate. </div> <p>Attachment 8 (Current location shown on google map) at 3.</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>The following screenshot shows the My Location button at top right and the My Location blue dot in the center of the map:</p>  <div style="border: 1px solid #ccc; padding: 5px; margin-bottom: 10px;"> <p>Geographical features cities, streets, etc., on Google Maps</p> </div> <div style="border: 1px solid #ccc; padding: 5px; margin-bottom: 10px;"> <p>Blue Dot indicating location the map</p> </div> <div style="border: 1px solid #ccc; padding: 5px;"> <p>Processor of the wireless communication device estimated the location of the wireless communication device (Exhibit B) from wireless communication network. The Blue dot showing estimated location.</p> </div> </div> <p>Source: Location estimation on the Wireless communication device</p> <p>Attachment 22 (Location estimation on the Wireless communication device) at 10.</p>

Claim 1	Corresponding Structure in Accused Systems
	<p>By default the “Location setting” is set at “High accuracy” mode, wherein, for example, accuracy of location of a communications device determined based on locations of nearby Wi-Fi network infrastructure (access points or hotspots) is further enhanced or fine-tuned by Google Maps Server additionally using the said communications device’s GPS location and the location data obtained from the mobile network (Cell tower information and/or Location of the communications device determined through the Assisted-GPS method by the said mobile network) serving the said communications device.</p>

Attachment 45 (Google Maps_Android app_Location settings) at 1.

Claim 1	Corresponding Structure in Accused Systems
<h2 data-bbox="372 255 1331 314">Find and improve your location's accuracy</h2> <p data-bbox="372 333 1465 430">Sometimes Google Maps might have trouble finding where you are located. If the GPS location of your blue dot on the map is inaccurate or the blue dot is not showing up, here are some things you can do to help fix the problem.</p> <p data-bbox="372 454 1192 483">Tip: This will also improve your search results and make them more relevant to you.</p> <p data-bbox="393 561 812 587">Computer Android iPhone & iPad</p> <hr/> <h3 data-bbox="372 682 1013 728">See your current location on the map</h3> <ol data-bbox="381 747 1455 870" style="list-style-type: none"> <li data-bbox="381 747 1046 777">1. On your Android phone or tablet, open the Google Maps app . <li data-bbox="381 808 1455 870">2. You'll see a blue dot, which shows where you are. If you don't see a blue dot, go to the bottom and tap Your location . <h3 data-bbox="372 933 1013 979">How Maps finds your current location</h3> <p data-bbox="372 998 861 1026">Maps estimates where you are from sources like:</p> <ul data-bbox="376 1047 1478 1191" style="list-style-type: none"> <li data-bbox="376 1047 1478 1108">• GPS: This uses satellites and knows your location up to around 20 meters. Note: When you're inside buildings or underground, the GPS is sometimes inaccurate. <li data-bbox="376 1121 1160 1151">• Wi-Fi: The location of nearby Wi-Fi networks helps Maps know where you are. <li data-bbox="376 1163 1331 1191">• Cell tower: Your connection to a cellular network can be accurate up to a few thousand meters. <p data-bbox="355 1201 1503 1262">Attachment 46 (Find and improve your location's accuracy - Android - Google Maps Help at 1.)</p>	

Claim 1	Corresponding Structure in Accused Systems
	<p>From your devices</p> <p>Many devices, like phones or computers, can work out their precise location. You can allow Google and other apps to provide you with useful features based on where your device is located. For example, if you're running late to meet your friends, you'll probably want to use a navigation app to know the quickest way to get to your destination. To get turn-by-turn directions, you may need to turn on your device's location and give the app the permission to access it. Or for some searches like "coffee shop", "bus stop" or "atm", results will usually be more helpful when precise location is available.</p> <p>On your Android device, if you choose to turn on your device location, you can use features like navigation, giving an app access to your current location, or find your phone. You can also choose which apps have permission to use your device's location with simple controls that let you turn the permission on or off for individual apps. On Android, you can see when an app is requesting to use your phone's GPS-based location when the top of your screen shows Location  Learn more</p> <p>Google Location Services</p> <p>On most Android devices, Google, as the network location provider, provides a location service called Google Location Services (GLS), known in Android 9 and above as Google Location Accuracy. This service aims to provide a more accurate device location and generally improve location accuracy. Most mobile phones are equipped with GPS, which uses signals from satellites to determine a device's location – however, with Google Location Services, additional information from nearby Wi-Fi, mobile networks, and device sensors can be collected to determine your device's location. It does this by periodically collecting location data from your device and using it in an anonymous way to improve location accuracy.</p> <p>You can disable Google Location Services at any time in your device's location settings. Your device's location will continue to work even if GLS is turned off, but the device will rely only on GPS to estimate device location for apps with the necessary permission. Google Location Services is distinct from your device's location setting. Learn more</p> <p>The settings and permissions on Android control whether your device sensors (like GPS) or network-based location (like GLS) are used to determine your location and which apps have access to that location. They do not impact how websites and apps might estimate your location in other ways, such as from your IP Address.</p> <p>Attachment 44 (How Google uses location information – Privacy & Terms – Google) at 2 &3.</p>

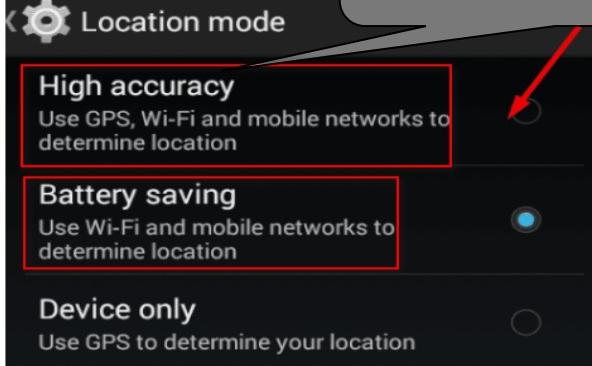
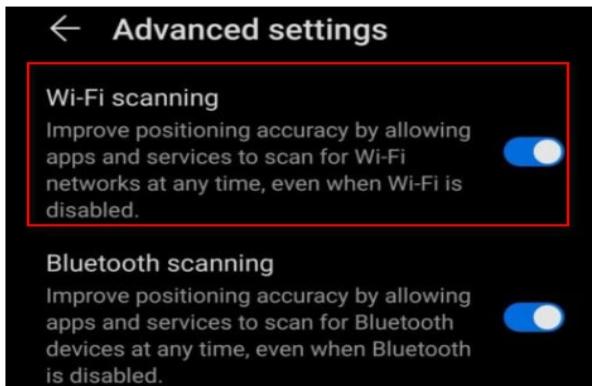


Wireless communication device receive the location of the Wireless communication device (Exhibit B) on Google Map from Wireless communication networks (e.g. Verizon, AT&T, T-Mobile, etc.)

Claim 1	Corresponding Structure in Accused Systems
	<p>Turn your phone's location accuracy on or off</p> <ol style="list-style-type: none"> 1. Open your device's Settings app. 2. Tap Location > Advanced > Google Location Accuracy. 3. Turn Improve Location Accuracy on or off.
	<p>When Google Location Accuracy is on</p> <p>When you have Google Location Accuracy turned on, your phone uses these sources to get location:</p> <ul style="list-style-type: none"> • GPS • Wi-Fi • Mobile networks • Sensors <p>When Google Location Accuracy is off</p> <p>When you turn off Google Location Accuracy, your phone uses only GPS to find location. GPS is less accurate than other sources.</p>
	<p>Let your phone scan for nearby networks or devices</p> <p>To help apps get better location info, you can let your phone scan for nearby Wi-Fi access points</p> <ol style="list-style-type: none"> 1. Open your device's Settings app. 2. Tap Location > Wi-Fi and Bluetooth scanning. 3. Turn Wi-Fi scanning or Bluetooth scanning on or off. <p>Attachment 21 (Manage your Pixel phone's location settings) at 2.</p>

Claim 1	Corresponding Structure in Accused Systems
<p>If you use an older Android version</p> <p>Choose location settings (Android 9.0)</p> <p>To change location settings:</p> <ol style="list-style-type: none"> 1. Open your device's Settings app. 2. Tap Security & Location > Location. <ul style="list-style-type: none"> • If you have a work profile, tap Advanced. <p>Then, choose an option:</p> <ul style="list-style-type: none"> • Turn Location on or off: Tap Location. • Scan for nearby networks: Tap Advanced > Scanning. Turn Wi-Fi scanning or Bluetooth scanning on or off. • Turn emergency location service on or off: Tap Advanced > Google Emergency Location Service. Turn Emergency Location Service on or off. <hr/> <p>Choose location mode (Android 4.4–8.1)</p> <p>You can choose your location mode based on accuracy, speed, and battery use.</p> <ol style="list-style-type: none"> 1. Open your phone's Settings app. 2. Tap Security & Location > Location. If you don't see "Security & Location," tap Location. 3. <u>Tap Mode</u>. Then pick: <ul style="list-style-type: none"> • High accuracy: Use GPS, Wi-Fi, mobile networks, and sensors to get the most accurate location. Use Google Location Services to help estimate your phone's location faster and more accurately. • Battery saving: Use sources that use less battery, like Wi-Fi and mobile networks. Use Google Location Services to help estimate your phone's location faster and more accurately. • Device only: Use only GPS. Don't use Google Location Services to provide location information. This can estimate your phone's location more slowly and use more battery. <hr/> <p>Choose location access (Android 4.1–4.3)</p> <p>You can control what location information your phone can use.</p> <ol style="list-style-type: none"> 1. Open your phone's Settings app. 2. Under "Personal," tap Location access. 3. At the top of the screen, turn Access to my location on or off. <ul style="list-style-type: none"> • When location access is on, pick either or both of: <ul style="list-style-type: none"> • GPS satellites: Lets your phone estimate its location from satellite signals, like a GPS device in a car. • Wi-Fi & mobile network location: Lets your phone use Google Location Services to help estimate its location faster, with or without GPS. • When location access is off: <ul style="list-style-type: none"> Your phone can't find its precise location or share it with any apps. <p>Tip: If you have a tablet that more than one person uses, each person can have different location access settings.</p>	

Attachment 40 (Manage your Pixel phone's location settings) at 3 & 4.

Claim 1	Corresponding Structure in Accused Systems
	<p>1. On your Android device, go to Settings 2. Tap Location and re-enable your location services 3. Select Mode High accuracy</p>  <p>The user of the wireless device can select the method of the location estimation</p> <p>On some phone models, this option can be found under the Advanced Settings option.</p> <p>Select Advanced Settings and enable your device to improve positioning accuracy by allowing apps to scan for Wi-Fi networks and Bluetooth devices at any time, even if Wi-Fi or Bluetooth is disabled.</p>  <p>Attachment 33 (Google Maps Not Updating Location) at 4.</p>

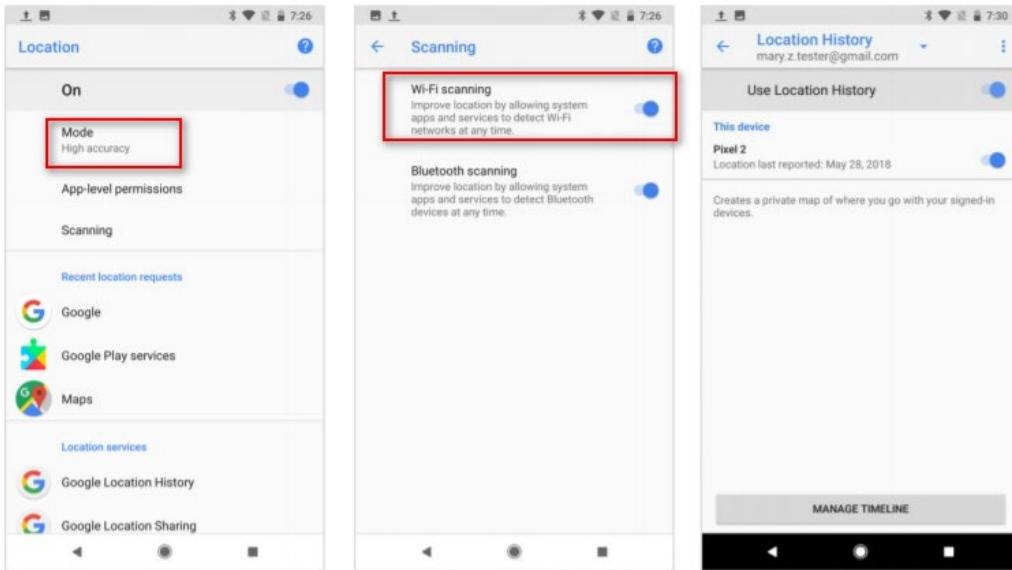
Claim 1	Corresponding Structure in Accused Systems		
	Description	Opt-In / Opt-Out	User Choices
LOCATION SERVICES	"Use Google's location service to help apps determine your location. Anonymous location data will be sent to Google when your device is on."	Opt-Out	"YES, I'M IN" or "SKIP"
LOCATION ACCURACY	Three Modes - "High accuracy", "Battery saving", and "Device only". Default setting: "High accuracy uses GPS, Wi-Fi, Bluetooth, or cellular networks to determine location".	Opt-Out	Toggle icon (right and colored for on, left and gray for off). This setting not shown during Android set-up.
LOCATION SCANNING	"Improve location accuracy by allowing apps and services to scan for Wi-Fi and Bluetooth, even when those settings are off."	Opt-Out	Toggle icon (right and colored for on, left and gray for off).
LOCATION HISTORY	"Allows Google to store a history of your location data from all devices where you are logged into your Google Account and have enabled Location Reporting. Location History and Location Reporting data may be used by any Google app or service."	Opt-Out	"YES, I'M IN" or "NO THANKS" In the context of "Give your new Assistant permission to help you"

Figure 1: Four Android settings and services that relate to location information collection.¹

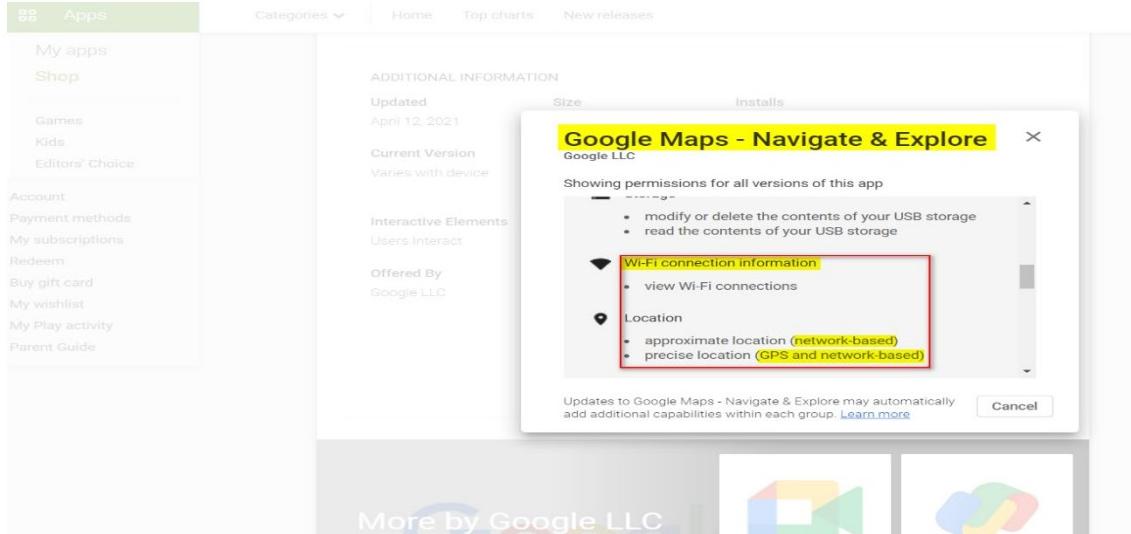
Google Location Services
 Google Location Services (GLS) operate at a device level and rely on sensors such as GPS, Wi-Fi, the cellular radio, and other technologies included in mobile devices to position a user in the world. If a user keeps the default settings prompted by Google, Location Services is enabled, Location Accuracy will be set to "High Accuracy"² and Location Scanning will be enabled for both Wi-Fi base stations and Bluetooth Beacons, regardless of a user's choice to turn Wi-Fi or Bluetooth on. The implications of user choices among the various Location Services settings are significant, but not intuitive, including:

- With Location Services turned on, Location Accuracy set to "Device only" and Location Scanning turned off, an Android device will only use GPS to provide the location of an Android device.
- When Location Accuracy is set to "High accuracy" and Location Scanning is enabled (the default setting for new device setup), an Android device will use sources including Wi-Fi, Bluetooth, and cellular radio to improve the accuracy of the device's position.

Attachment 38 (Google, Android and Location Tracking) at 2.

Claim 1	Corresponding Structure in Accused Systems
	<p>After completing the setup process users can validate and control settings for device location via the Settings app and navigating to Google settings, then Location (Figure 4).</p>  <p>Figure 4: Location settings after Android device setup process</p> <p>As demonstrated in Figure 4, if users accept Google's defaults during the setup process, the Android device is configured with Location Services enabled, Wi-Fi and Bluetooth scanning engaged, and Location History active.</p> <p>Attachment 38 (Google, Android and Location Tracking) at 5.</p>

Claim 1	Corresponding Structure in Accused Systems
	<p>Users can choose to disable GLS during the set-up process. However, if a user attempts to disable GLS, a warning dialogue box prompts an extreme scenario: “device location for all apps is turned off and you may not be able to locate your device if it is lost.” (Figure 5) Note as well, the action prompt is to “Turn on Location” – reversing the user choice triggering the warning. Further, as described immediately below, many Google and third party apps will not function unless GLS is turned on. Therefore, Google forces user into an impossible ultimatum, have their every move constantly monitored, tracked, and stored or lose the functionality of their expensive smartphone.</p> <p>If a user disables Location Services but then attempts to use a location aware app or service on their device, she will see the dialogue box shown in Figure 6. If the user clicks “OK” the service is enabled for the entire device and permanently, rather than enabling Location Services only for that particular app or service requesting the functionality.</p> <div data-bbox="518 608 835 1094" style="float: left; margin-right: 20px;"> </div> <div data-bbox="518 1098 835 1123" data-label="Caption">Figure 5: Location Services Warning</div> <div data-bbox="926 608 1243 1094" style="float: right;"> </div> <div data-bbox="959 1098 1220 1142" data-label="Caption">Figure 6: Re-Enable Location Services</div> <p>Attachment 38 (Google, Android and Location Tracking) at 6.</p> <p>We collect information about your location when you use our services, which helps us offer features like driving directions for your weekend getaway or showtimes for movies playing near you.</p> <p>Your location can be determined with varying degrees of accuracy by:</p> <ul style="list-style-type: none"> • GPS • IP address • Sensor data from your device • Information about things near your device, such as Wi-Fi access points, cell towers, and Bluetooth-enabled devices <p>The types of location data we collect depend in part on your device and account settings. For example, you can turn your Android device's location on or off using the device's settings app. You can also turn on Location History if you want to create a private map of where you go with your signed-in devices.</p> <p>Attachment 29 (Google Privacy Policy) at 4.</p>

Claim 1	Corresponding Structure in Accused Systems
	 <p>The screenshot shows the Google Play Store interface. On the left, there's a sidebar with links like 'My apps', 'Shop', 'Games', 'Kids', 'Editors' Choice', 'Account', 'Payment methods', 'My subscriptions', 'Redeem', 'Buy gift card', 'My wishlist', 'My Play activity', and 'Parent Guide'. The main area displays 'ADDITIONAL INFORMATION' for the 'Google Maps - Navigate & Explore' app by Google LLC. It shows the app was updated on April 12, 2021, and its current version varies with device. Under 'Interactive Elements', it says 'Users interact'. The 'Offered By' section shows Google LLC. A modal window titled 'Google Maps - Navigate & Explore' is open, showing 'Showing permissions for all versions of this app'. It lists several permissions, with a red box highlighting the 'Wi-Fi connection information' and 'Location' sections. The 'Wi-Fi connection information' section includes 'view Wi-Fi connections'. The 'Location' section includes 'approximate location (network-based)' and 'precise location (GPS and network-based)'. At the bottom of the modal, there's a note about updates adding more capabilities, a 'Cancel' button, and the 'More by Google LLC' logo.</p>

Attachment 39 (Google Map_Permissions) at 1.

Overview



The Google Maps Geolocation API returns a location and accuracy radius based on information about **cell towers and WiFi nodes** that the mobile client can detect. This document describes the protocol used to send this data to **the server** and to return a response to the client.

Communication is done over HTTPS using POST. Both request and response are formatted as JSON, and the content type of both is `application/json`.

Attachment 17 (Cell Towers/Wi-Fi Nodes (RF transceivers) in a wireless communication network) at 1.

Knowing where the user is allows your application to be smarter and deliver better information to the user. When developing a location-aware application for Android, you can utilize GPS and Android's Network Location Provider to acquire the user location. Although GPS is most accurate, it only works outdoors, it quickly consumes battery power, and doesn't return the location as quickly as users want. **Android's Network Location Provider determines user location using cell tower and Wi-Fi signals,** providing location information in a way that works indoors and outdoors, responds faster, and uses less battery power. To obtain the user location in your application, you can use both GPS and the Network Location Provider, or just one.

Attachment 12 (Location of the device determined using cell tower) at 1&2.

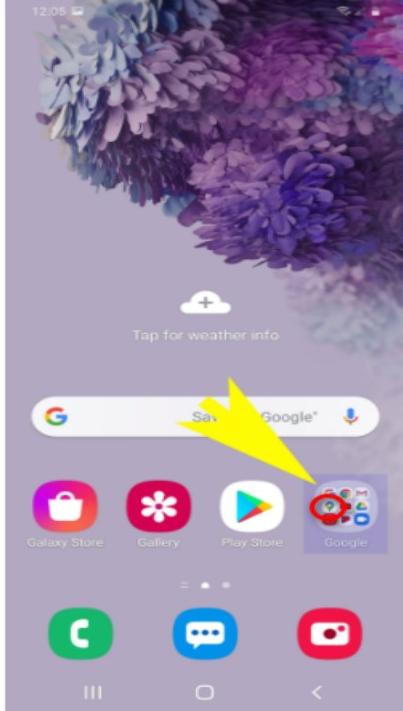
Claim 1	Corresponding Structure in Accused Systems
	<p>The first parameter in <code>requestLocationUpdates()</code> is the type of location provider to use (in this case, the Network Location Provider for cell tower and Wi-Fi based location). You can control the frequency at which your listener receives updates with the second and third parameter—the second is the minimum time interval between notifications and the third is the minimum change in distance between notifications—setting both to zero requests location notifications as frequently as possible. The last parameter is your <code>LocationListener</code>, which receives callbacks for location updates.</p> <p>To request location updates from the GPS provider, use <code>GPS_PROVIDER</code> instead of <code>NETWORK_PROVIDER</code>. You can also request location updates from both the GPS and the Network Location Provider by calling <code>requestLocationUpdates()</code> twice—once for <code>NETWORK_PROVIDER</code> and once for <code>GPS_PROVIDER</code>.</p> <p>Requesting User Permissions</p> <p>In order to receive location updates from <code>NETWORK_PROVIDER</code>, you must request either <code>ACCESS_COARSE_LOCATION</code> or <code>ACCESS_FINE_LOCATION</code> permission, respectively, in your Android manifest file. Without these permissions, your application will fail at runtime when requesting location updates.</p> <p>If you are using both <code>NETWORK_PROVIDER</code> and <code>GPS_PROVIDER</code>, then you need to request only the <code>ACCESS_FINE_LOCATION</code> permission, because it includes permission for both providers. Permission for <code>ACCESS_COARSE_LOCATION</code> allows access only to <code>NETWORK_PROVIDER</code>.</p> <p>Attachment 12 (Location is estimated using cell tower/wi-fi network) at 3 & 4.</p> <p>Flow for obtaining user location</p> <p>Here's the typical flow of procedures for obtaining the user location:</p> <ol style="list-style-type: none"> 1. Start application. 2. Sometime later, start listening for updates from desired location providers. 3. Maintain a "current best estimate" of location by filtering out new, but less accurate fixes. 4. Stop listening for location updates. 5. Take advantage of the last best location estimate. <p>Figure 1 demonstrates this model in a timeline that visualizes the period in which an application is listening for location updates and the events that occur during that time.</p> <p>The diagram illustrates a timeline of events for obtaining user location. It starts with 'Application starts' and ends with 'Best estimate of the location is used in the application'. Key events include: <ul style="list-style-type: none"> 'Listen for GPS and Network updates' 'Cached network location is retrieved' 'Cached GPS location is dismissed as too old' 'New Cell-ID fix is received' 'A WiFi-based location is obtained' 'New WiFi-based location is dismissed due to larger error estimates' 'A GPS location replaces current best estimate' 'Stop listening for updates' Red X marks indicate events that are dismissed or replaced. An arrow labeled 'Time (t)' points to the right, indicating the progression of time.</p> <p>Attachment 12 (Location is estimated using cell tower/wi-fi network) at 5.</p>

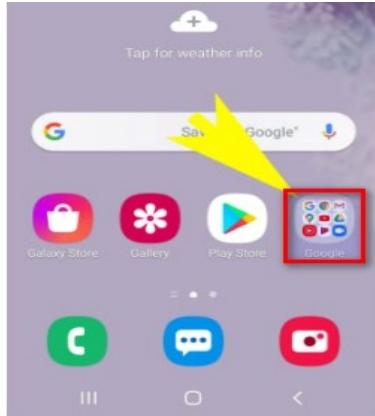
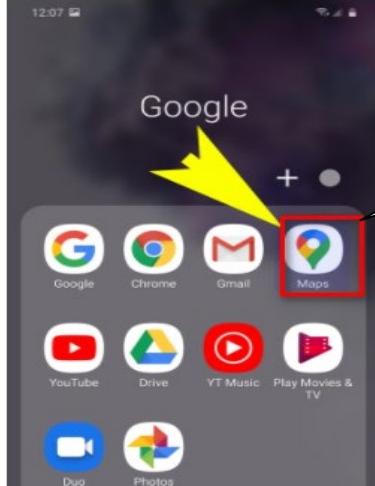
Claim 1	Corresponding Structure in Accused Systems
	<p>There are 3 location providers in Android.</p> <p>They are:</p> <p>gps → (GPS, AGPS): Name of the GPS location provider. This provider determines location using satellites. Depending on conditions, this provider may take a while to return a location fix. Requires the permission android.permission.ACCESS_FINE_LOCATION.</p> <p>network → (AGPS, CellID, WiFi MACID): Name of the network location provider. This provider determines location based on availability of cell tower and WiFi access points. Results are retrieved by means of a network lookup. Requires either of the permissions android.permission.ACCESS_COARSE_LOCATION or android.permission.ACCESS_FINE_LOCATION.</p> <p>passive → (CellID, WiFi MACID) A special location provider for receiving locations without actually initiating a location fix. This provider can be used to passively receive location updates when other applications or services request them without actually requesting the locations yourself. This provider will return locations generated by other providers. Requires the permission android.permission.ACCESS_FINE_LOCATION, although if the GPS is not enabled this provider might only return coarse fixes. This is what Android calls these location providers, however, the underlying technologies to make this stuff work is mapped to the specific set of hardware and telco provided capabilities (network service).</p> <p>The best way is to use the “network” or “passive” provider first, and then fallback on “gps”, and depending on the task, switch between providers. This covers all cases, and provides a lowest common denominator service (in the worst case) and great service (in the best case).</p> <p>Attachment 41 (Android Location Providers - GPS or Network Provider?) at 1 & 2.</p> <p>Accuracy</p> <p>You can specify location accuracy using the <code>setPriority()</code> method, passing one of the following values as the argument:</p> <ul style="list-style-type: none"> • PRIORITY_HIGH_ACCURACY provides the most accurate location possible, which is computed using as many inputs as necessary (it enables GPS, Wi-Fi, and cell, and uses a variety of Sensors), and may cause significant battery drain. • PRIORITY_BALANCED_POWER_ACCURACY provides accurate location while optimizing for power. Very rarely uses GPS. Typically uses a combination of Wi-Fi and cell information to compute device location. • PRIORITY_LOW_POWER largely relies on cell towers and avoids GPS and Wi-Fi inputs, providing coarse (city-level) accuracy with minimal battery drain. • PRIORITY_NO_POWER receives locations passively from other apps for which location has already been computed. <p>The location needs of most apps can be satisfied using the balanced power or low power options. High accuracy should be reserved for apps that are running in the foreground and require <i>real time</i> location updates (for example, a mapping app).</p> <p>Attachment 42 (Optimize location for battery) at 2.</p> <p>Traffic conditions [edit]</p> <p>In 2007, Google began offering traffic data as a colored overlay on top of roads and motorways to represent the speed of vehicles on particular roads. Crowdsourcing is used to obtain the GPS-determined locations of a large number of cellphone users, from which live traffic maps are produced.^{[59][60][61]}</p> <p>Google has stated that the speed and location information it collects to calculate traffic conditions is anonymous.^[62] Options available in each phone's settings allow users not to share information about their location with Google Maps.^[63] Google stated, "Once you disable or opt out of My Location, Maps will not continue to send radio information back to Google servers to determine your handset's approximate location".^{[64][failed verification]}</p> <p>Attachment 43 (Google Maps Wikipedia) at 5 & 6.</p>

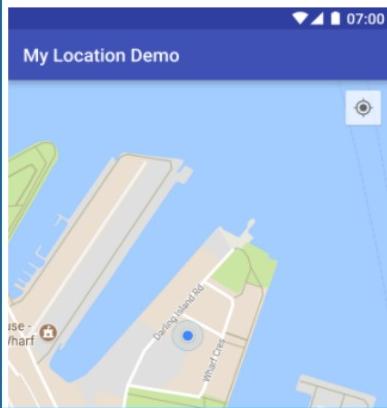
Claim 1	Corresponding Structure in Accused Systems
<p>according to mapping information stored within the wireless mobile communications device,</p>	<p>Plaintiff contends the Exhibit-B-listed mobile-wireless-communications device's motherboard processor is programmed to process location-service information; i.e., to receive a location of the device from the wireless communications network and generate an indication of the device's location.</p> <p>For example, the motherboard processor may use Google Maps to obtain the device's location and provide direction from that location to a destination. Wireless mobile communication device-including but not limited to Google's branded devices such as Google Pixel 5, pixel 4a 5G, pixel 4a, pixel 4 XL, pixel 4, pixel 3a XL, pixel 3a, pixel 3 XL, pixel 3, pixel 2, pixel 2 XL, pixel XL, pixel, pixel C or other (third-parties) branded devices such as Samsung Galaxy S20 Ultra, Galaxy S20 plus, Galaxy S20, Galaxy Z fold, Galaxy S10, Galaxy A series, etc. (refer Exhibit B for complete list) has a processor for example, Quad-Core processor. When wireless communication device transceivers and processor are in communication, they are coupled. Further, the Location-based Service (LBS) provider, such as Google Map, on the Exhibit-B utilizes the processor coupled to the transceiver to estimates/receive the location on mobile wireless communications devices (specifically one or more of the mobile wireless communications devices identified on Exhibit B) by utilizing wireless communication network or first computer.</p> <p>For example, the motherboard processor may use Google Maps to view and find places around the globe. Google map can also show your current location and provide direction (including with respect to geographic features such as nearby restaurants) from your location/source to any destination. In using Google Maps App, the mobile wireless communication device's motherboard processor generates signals for displaying on the device's screen a blue dot that shows the current location of the wireless mobile communication device. The Google map app estimates the location of the device from 3 sources: GPS (GPS uses satellites and knows your location within a few meters), Wi-Fi (the location of nearby Wi-Fi networks helps Maps know where you are), and cell towers (cell tower can be accurate up to a few thousand meters). When Google Maps isn't sure about your location, a light blue circle around the blue dot is shown. You might be anywhere within the light blue circle. The smaller the circle, the more certain the app is about your location.</p> <p>Furthermore, Plaintiff contends Google Maps App provides flexibility to download maps on SD card/internal memory of communication device (Exhibit B) examples of compatible devices is Samsung Galaxy S20, Pixel 4a, Pixel 4a 5G, Pixel 5, etc., and navigate offline. When internet is slow or mobile data is expensive, or communication device cannot connect to internet, an area can be saved to phone or tablet (Exhibit B) from Google maps app and use it when offline. Communication device can use Offline maps for Navigation through the downloaded area without internet.</p> <p>The following exemplifies the existence of this limitation in Accused Systems:</p>

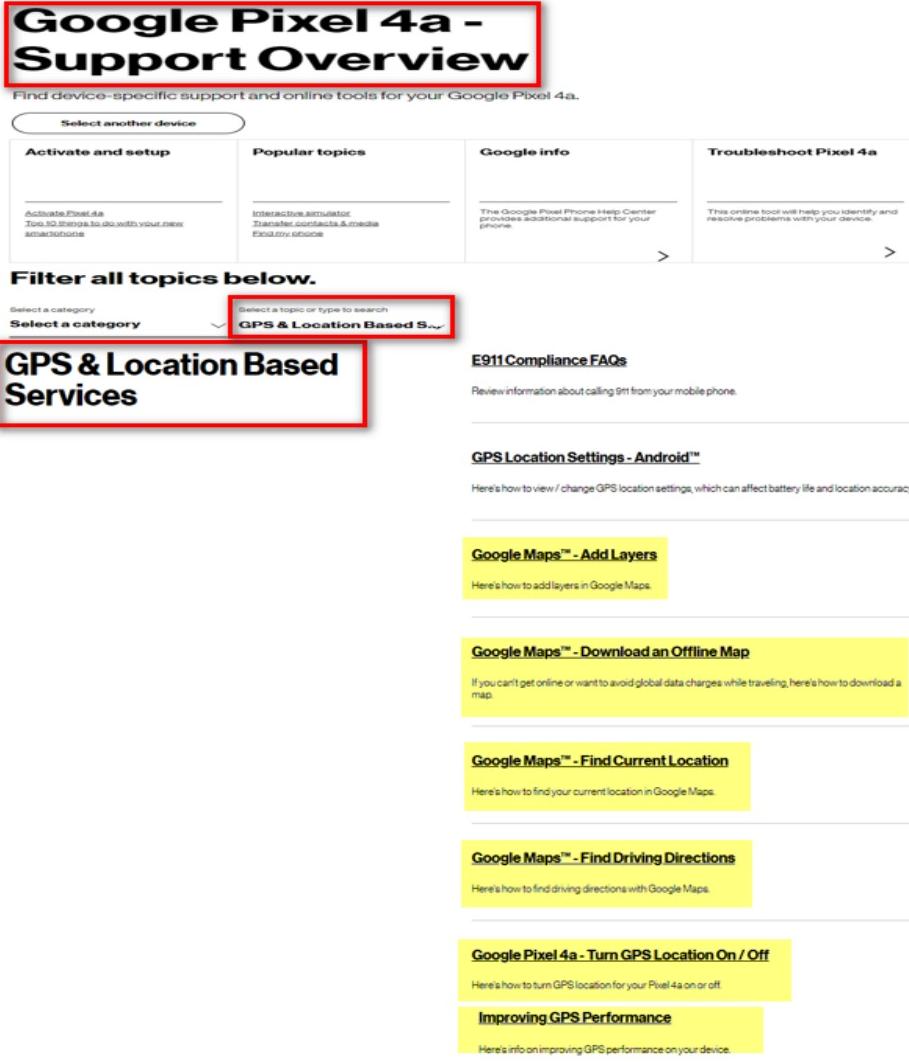
Claim 1	Corresponding Structure in Accused Systems			
	<p>FULL OR DIFFERENCES</p> <p>Change compare mode</p>	Google Pixel 4a	Google Pixel 4a 5G	Google Pixel 5
<p>Preloaded application Google Map on the Wireless mobile device utilizes the processor coupled to the transceiver to estimates/receive the location on mobile wireless communications device by utilizing wireless communication network</p>				
NETWORK	Technology	GSM / HSPA / LTE	GSM / HSPA / LTE / 5G	GSM / CDMA / HSPA / EVDO / LTE / 5G
LAUNCH	Announced Status	2020, August 03 Available. Released 2020, August 20	2020, September 30 Available. Released 2020, November 05	2020, September 30 Available. Released 2020, October 15
BODY	Dimensions	144 x 69.4 x 8.2 mm (5.67 x 2.73 x 0.32 in)	153.9 x 74 x 8.2 mm (Sub-6) or 8.5 mm (Sub-6 and mmWave)	144.7 x 70.4 x 8 mm (5.70 x 2.77 x 0.31 in)
	Weight	143 g (5.04 oz)	168 g (5G Sub-6); 171 g (5G Sub-6 and mmWave) (5.93 oz)	151 g (5.33 oz)
	Build	Glass front (Gorilla Glass 3), plastic back, plastic frame	Glass front (Gorilla Glass 3), plastic back, plastic frame	Glass front (Gorilla Glass 6), aluminum back, aluminum frame
	SIM	Nano-SIM and/or eSIM	Nano-SIM and/or eSIM	Nano-SIM and/or eSIM IP68 dust/water resistant (up to 1.5m for 30 mins)
DISPLAY	Type	OLED, HDR	OLED, HDR	OLED, 90Hz, HDR10+
	Size	5.81 inches, 83.2 cm ² (~83.3% screen-to-body ratio)	6.2 inches, 95.7 cm ² (~84.1% screen-to-body ratio)	6.0 inches, 87.6 cm ² (~85.9% screen-to-body ratio)
	Resolution	1080 x 2340 pixels, 19.5:9 ratio (~443 ppi density)	1080 x 2340 pixels, 19.5:9 ratio (~413 ppi density)	1080 x 2340 pixels, 19.5:9 ratio (~432 ppi density)
	Protection	Corning Gorilla Glass 3 Always-on display	Corning Gorilla Glass 3 Always-on display	Corning Gorilla Glass 6 Always-on display
PLATFORM	OS	Android 10, upgradable to Android 11	Android 11	Android 11
	Chipset	Qualcomm SDM730 Snapdragon 730G (8 nm)	Qualcomm SM7250 Snapdragon 765G (7 nm)	Qualcomm SM7250 Snapdragon 765G (7 nm)
	CPU	Octa-core (2x2.2 GHz Kryo 470 Gold & 6x1.8 GHz Kryo 470 Silver)	Octa-core (1x2.4 GHz Kryo 475 Prime & 1x2.2 GHz Kryo 475 Gold & 6x1.8 GHz Kryo 475 Silver)	Octa-core (1x2.4 GHz Kryo 475 Prime & 1x2.2 GHz Kryo 475 Gold & 6x1.8 GHz Kryo 475 Silver)
	GPU	Adreno 618	Adreno 620	Adreno 620

Attachment 4 (Processor of Google Pixel 4a, Pixel 4a 5G and Pixel 5) at 1.

Claim 1	Corresponding Structure in Accused Systems
	<p>Using Turn-by-Turn Navigation with the Galaxy S20 Google Maps</p> <p>Time Needed : 8 minutes</p> <p>The following steps demonstrate the actual process of setting up and utilizing turn-by-turn navigation system with the Google Maps app on the new Samsung Galaxy S20 handset.</p> <p>Before you begin, verify and ensure that location is enabled on your phone. It has to be enabled so that your device can determine your current location.</p> <p>1. Tap to open the Google folder from the Home screen. A new screen consisting of Google-related apps and services will be displayed.</p>  <div data-bbox="889 686 1460 834" style="border: 1px solid black; padding: 5px;"> <p>Google Maps preloaded in the Wireless mobile communication devices (Exhibit B), such as Galaxy S20. Current location of the device is determined if location is enabled.</p> </div> <p>Attachment 5 (how to use turn by turn Google map) at 1.</p>

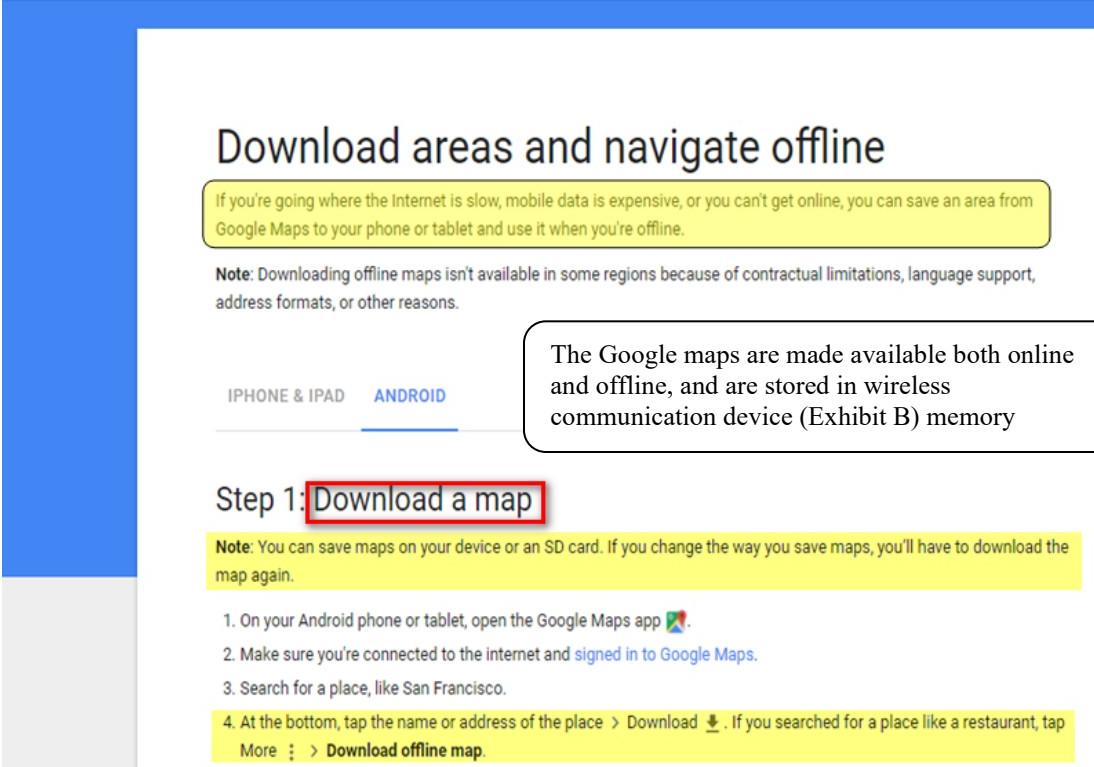
Claim 1	Corresponding Structure in Accused Systems
	 <p>2. Tap Maps to open Google Maps app. If this is the first time you use Google Maps on your Galaxy S20, you'll be prompted with a Welcome screen. If you see this screen, read and review the information then tap GOT IT to proceed.</p>  <p>Attachment 5 (how to use turn by turn google map) at 2&3.</p> <div style="display: flex; justify-content: space-between;"> verizon Personal Business Shop Why Verizon Support </div> <p>Home > Support > Sony > Sony Xperia Z2 > Google Maps - Find Current Location</p> <h2>Google Maps™ - Find Current Location</h2> <p>Notes:</p> <ul style="list-style-type: none"> If the Google Maps app isn't already installed on your device, it can be downloaded from the Google Play Store™. For further assistance, refer to the Google Maps Help Center. <ol style="list-style-type: none"> From a Home screen, tap Apps. Tap Maps . Tap the My Location icon . <div style="border: 1px solid black; padding: 5px; margin-left: 20px;"> <p>Wireless communication networks (e.g. Verizon, AT&T, T-Mobile, etc.) estimate/determine the location of the Wireless communication device (Exhibit B) on Google Maps.</p> </div>

Claim 1	Corresponding Structure in Accused Systems
	Attachment 6 (Find Current Location on Google map) at 1.
	 <p data-bbox="421 418 1148 460">How Maps finds your current location</p> <p data-bbox="421 481 936 506">Maps estimates where you are from sources like:</p> <ul data-bbox="425 530 1449 633" style="list-style-type: none"> • GPS: This uses satellites and knows your location within a few meters. • Wi-Fi: The location of nearby Wi-Fi networks helps Maps know where you are. • Cell tower: Your connection to a cellular network can be accurate up to a few thousand meters.
	<p data-bbox="355 663 1086 696">Attachment 8 (How map finds your current location) at 2.</p> <div data-bbox="388 726 789 760" style="border: 1px solid black; padding: 5px;">What the blue dot means</div> <div data-bbox="388 775 1434 853" style="border: 1px solid black; padding: 5px; background-color: #ffffcc;"> <p>The blue dot shows you where you are on the map. When Google Maps isn't sure about your location, you'll see a light blue circle around the blue dot. You might be anywhere within the light blue circle. The smaller the circle, the more certain the app is about your location.</p> </div> <p data-bbox="388 870 453 893">Notes:</p> <ul data-bbox="388 914 1405 1017" style="list-style-type: none"> • If the blue dot is not showing, or the dot is gray, this means that we can't find your current location and we're showing you the last location you visited. • If there's something between you and cell towers, like a parking garage or tall buildings, your blue dot might not be accurate.
	<p data-bbox="355 1068 1109 1102">Attachment 8 (Current location shown on google map) at 3.</p> <p data-bbox="372 1123 1470 1184">The following screenshot shows the My Location button at top right and the My Location blue dot in the center of the map:</p> <div data-bbox="365 1205 752 1613">  </div> <div data-bbox="796 1184 1201 1214" style="border: 1px solid black; border-radius: 10px; padding: 5px;">Blue Dot indicating location the map</div> <div data-bbox="796 1279 1266 1436" style="border: 1px solid black; border-radius: 10px; padding: 10px;">Processor of the wireless communication device estimated the location of the wireless communication device (Exhibit B) from wireless communication network. The Blue dot showing estimated location.</div> <div data-bbox="796 1507 1429 1537" style="border: 1px solid black; border-radius: 10px; padding: 5px;">Geographical features cities, streets, etc., on Google Maps</div>
	<p data-bbox="355 1638 1165 1670">Source: Location estimation on the Wireless communication device</p> <p data-bbox="355 1685 1388 1717">Attachment 22 (Location estimation on the Wireless communication device) at 10.</p>

Claim 1	Corresponding Structure in Accused Systems								
	 <p>Google Pixel 4a - Support Overview</p> <p>Find device-specific support and online tools for your Google Pixel 4a.</p> <p>Select another device</p> <table border="1"> <tr> <td>Activate and setup</td> <td>Popular topics</td> <td>Google info</td> <td>Troubleshoot Pixel 4a</td> </tr> <tr> <td>Activate Pixel 4a Two SIMs to do with your new smartphone</td> <td>Interactive simulator Transfer contacts & media Find my phone</td> <td>The Google Pixel Phone Help Center provides additional support for your phone.</td> <td>This online tool will help you identify and resolve problems with your device.</td> </tr> </table> <p>Filter all topics below.</p> <p>Select a category</p> <p>GPS & Location Based Services</p> <p>E911 Compliance FAQs</p> <p>Review information about calling 911 from your mobile phone.</p> <p>GPS Location Settings - Android™</p> <p>Here's how to view / change GPS location settings, which can affect battery life and location accuracy.</p> <p>Google Maps™ - Add Layers</p> <p>Here's how to add layers in Google Maps.</p> <p>Google Maps™ - Download an Offline Map</p> <p>If you can't get online or want to avoid global data charges while traveling, here's how to download a map.</p> <p>Google Maps™ - Find Current Location</p> <p>Here's how to find your current location in Google Maps.</p> <p>Google Maps™ - Find Driving Directions</p> <p>Here's how to find driving directions with Google Maps.</p> <p>Google Pixel 4a - Turn GPS Location On / Off</p> <p>Here's how to turn GPS location for your Pixel 4a on or off.</p> <p>Improving GPS Performance</p> <p>Here's info on improving GPS performance on your device.</p>	Activate and setup	Popular topics	Google info	Troubleshoot Pixel 4a	Activate Pixel 4a Two SIMs to do with your new smartphone	Interactive simulator Transfer contacts & media Find my phone	The Google Pixel Phone Help Center provides additional support for your phone.	This online tool will help you identify and resolve problems with your device.
Activate and setup	Popular topics	Google info	Troubleshoot Pixel 4a						
Activate Pixel 4a Two SIMs to do with your new smartphone	Interactive simulator Transfer contacts & media Find my phone	The Google Pixel Phone Help Center provides additional support for your phone.	This online tool will help you identify and resolve problems with your device.						

Attachment 16 (How to use Pixel 4a GPS and location-based services) at 9.

Claim 1	Corresponding Structure in Accused Systems
	<p>verizon</p> <p>Personal Business Shop Why Verizon Support</p> <p>Home > Support > Google > Google Pixel 4a > Google Maps - Download an Offline Map</p> <h2>Google Maps™ - Download an Offline Map</h2> <p>Download and Save a Map</p> <p>⚠️ Downloading offline maps isn't available in some regions.</p> <ol style="list-style-type: none"> From a Home screen, tap Apps. Tap Maps. Tap the Search bar (located at the top) and enter the desired destination. Tap the destination (located at the bottom). Tap the Menu icon : (located in the upper-right). Tap Save offline map. Tap Save (located in the lower-right). If preferred, enter a name for the map then tap Save. <p>View Saved Maps</p> <ol style="list-style-type: none"> From a Home screen, tap Apps. Tap Maps. Tap the Menu icon (located in the upper-left). Tap Your places. Tap the appropriate map. <p>💡 For additional info on downloading maps, refer to this Google support article.</p> <p>Attachment 10 (Google Map-Download an offline map on pixel 4a) at 1.</p>

Claim 1	Corresponding Structure in Accused Systems
	 <p>Google Search Google Maps Help</p> <h2>Download areas and navigate offline</h2> <p>If you're going where the Internet is slow, mobile data is expensive, or you can't get online, you can save an area from Google Maps to your phone or tablet and use it when you're offline.</p> <p>Note: Downloading offline maps isn't available in some regions because of contractual limitations, language support, address formats, or other reasons.</p> <p>IPHONE & IPAD ANDROID</p> <p>The Google maps are made available both online and offline, and are stored in wireless communication device (Exhibit B) memory</p> <p>Step 1: Download a map</p> <p>Note: You can save maps on your device or an SD card. If you change the way you save maps, you'll have to download the map again.</p> <ol style="list-style-type: none"> 1. On your Android phone or tablet, open the Google Maps app 📱. 2. Make sure you're connected to the internet and signed in to Google Maps. 3. Search for a place, like San Francisco. 4. At the bottom, tap the name or address of the place > Download ⏪. If you searched for a place like a restaurant, tap More ⚙ > Download offline map.

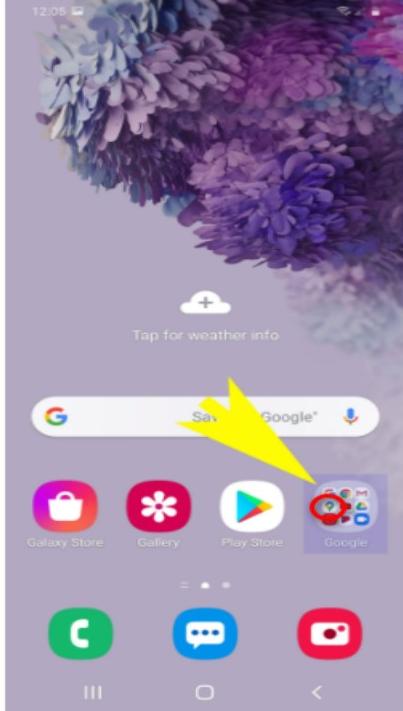
Attachment 9 (Mapping information stored on wireless communication device) at 1.

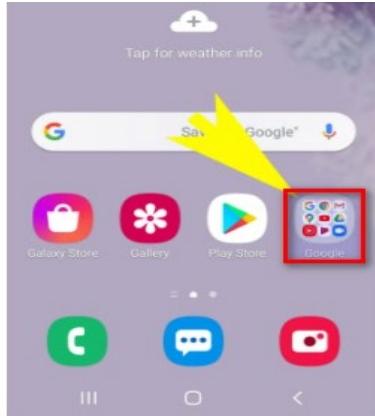
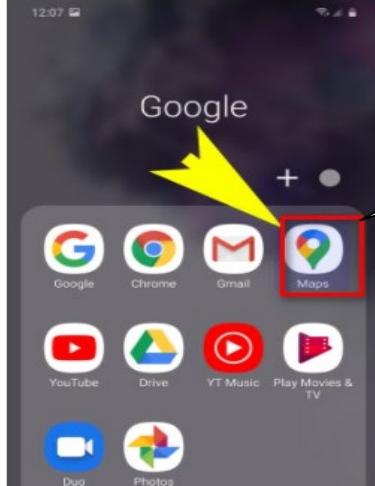
Claim 1	Corresponding Structure in Accused Systems
	<p>Save a route</p> <ol style="list-style-type: none"> 1. On your Android phone or tablet, open the Google Maps app . 2. Make sure you're connected to the Internet. 3. Search for your destination or tap it on the map. 4. In the bottom left, tap Directions . 5. From the top, choose your mode of transit. 6. Tap the white bar at the bottom. It's the one that shows the travel time and distance. 7. At the bottom, tap Save offline. <p>Tip:</p> <ul style="list-style-type: none"> • Your route is saved on your phone or tablet. Make sure to use the same phone or tablet when looking for a saved route. • Your saved route expires after 30 days. • Your route will show you the same mode of transit you chose when you saved the route. <p>Find a saved route</p> <ol style="list-style-type: none"> 1. On your Android phone or tablet, open the Google Maps app . 2. At the bottom, tap Saved offline route. <p>Tip:</p> <ul style="list-style-type: none"> • If you save a route from "Your location" and look up a saved route, the directions will start from the place where you saved the route. The directions won't start from your current location. • To get updated information like traffic, tap Refresh . • Turn-by-turn navigation isn't currently available for saved routes. To search for places and get turn-by-turn navigation, download an offline area. <p>Attachment 32 (Get directions & show routes) at 3.</p>

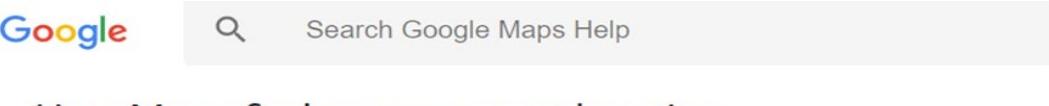
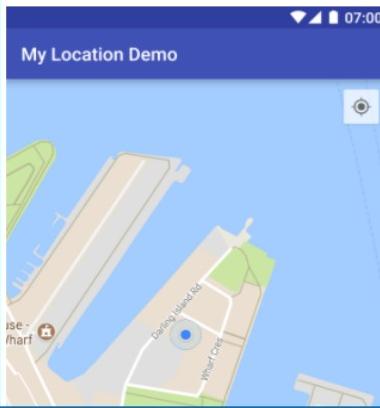
Claim 1	Corresponding Structure in Accused Systems
	<p>Use offline maps</p> <p>After you download an area, use the Google Maps app just like you normally would.</p> <ul style="list-style-type: none"> • Get directions and see routes • Use navigation • Search for locations <p>If your Internet connection is slow or absent, Google Maps will use your offline maps to give you directions.</p> <p>Notes:</p> <ul style="list-style-type: none"> • You can get driving directions offline, but not transit, bicycling, or walking directions. In your driving directions, you won't have traffic info, alternate routes, or lane guidance. • To save cell data and battery life, use "Wi-Fi only" mode. In this mode, when you're not connected to Wi-Fi, Google Maps will only use data from the offline maps that you've downloaded. Before you use this mode, make sure you download offline maps. To turn on this mode, tap your profile picture or initial 🚙 > Settings⚙️ > turn on Wi-Fi only. <p>Manage offline maps</p> <p>See a list of your offline maps</p> <ol style="list-style-type: none"> 1. On your Android phone or tablet, open the Google Maps app 🛍. 2. Tap your profile picture or initial 🚙 > Offline maps. <p>You can select your own map to download, or view maps you've already downloaded.</p>
	<p>Attachment 31 (Download google map) at 2.</p> <p>and wherein the first processor determines user navigation information and displays the user navigation information according to the location of the wireless mobile communications device with respect to the geographic features and a destination specified at the wireless mobile communications device,</p> <p>Plaintiff contends the motherboard processor (i.e., processor on the motherboard) of each Exhibit-B-listed item (i.e., mobile Wireless communications device) meets this limitation. The processor processes location-service information, including displaying user navigation information according to the device's location with regards to geographic features and a user-specified Destination. For example, using Google map app for more examples of location services processed by each Exhibit-B device's motherboard processor) the device user locates the device's current location on the google map app and then provide details for a destination on the options, provided in the Google map app. The user can then navigate (i.e., the processor processes display information) in real time from current location to destination. The processor displays navigation in the Google Maps app to display turn-by-turn directions. Using the Google map app, the processor will show the directions and use real-time traffic information to find the best route to the specified destination.</p> <p>The following exemplifies this limitation's existence in Accused Systems:</p>

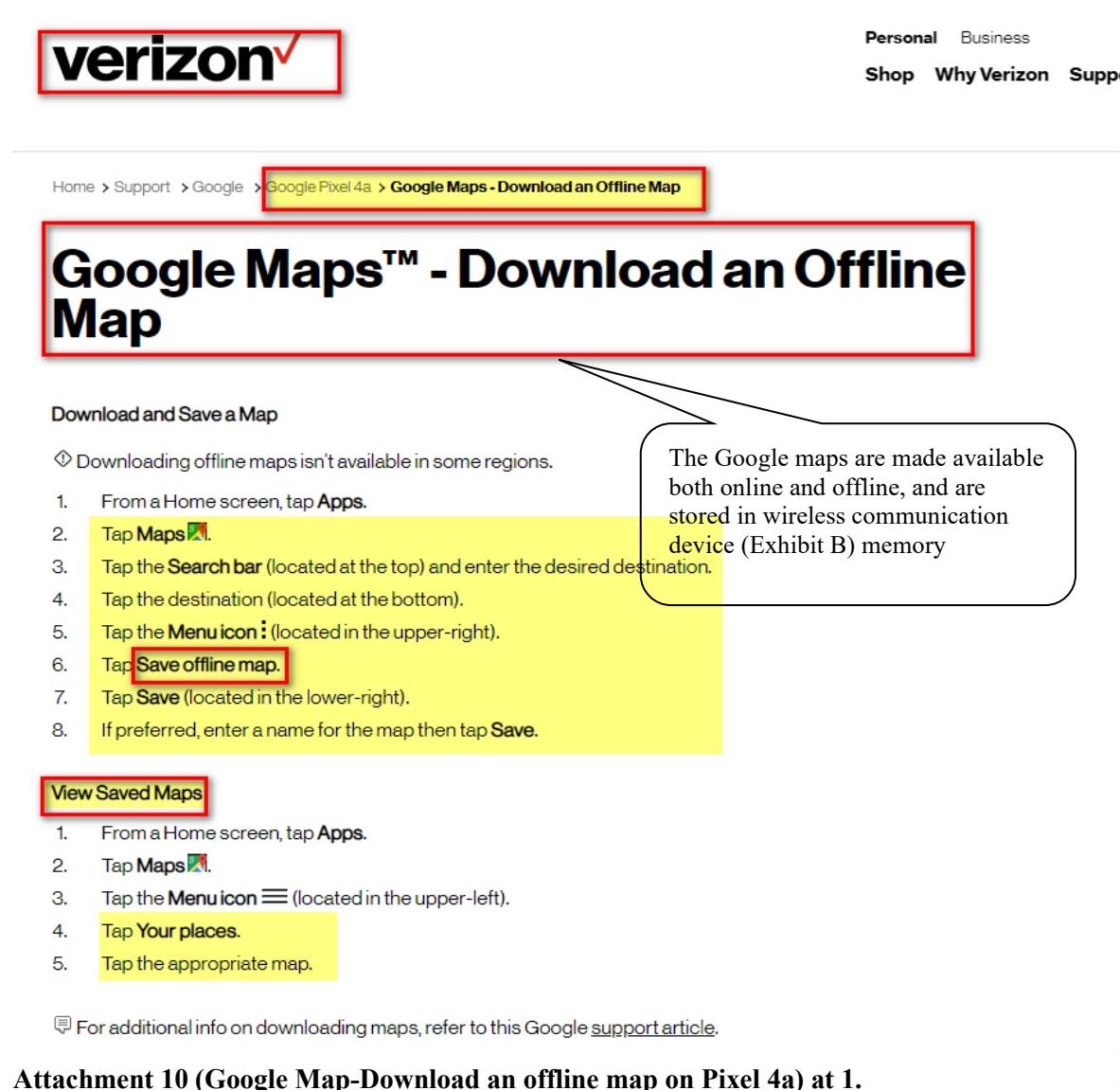
Claim 1	Corresponding Structure in Accused Systems			
	 <p>FULL OR DIFFERENCES <small>Change compare mode</small></p>	Google Pixel 4a	Google Pixel 4a 5G	Google Pixel 5
<p>Preloaded application Google Map on the Wireless mobile device utilizes the processor coupled to the transceiver to estimates/receive the location on mobile wireless communications device by utilizing wireless communication network</p>				
NETWORK	Technology	GSM / HSPA / LTE	GSM / HSPA / LTE / 5G	GSM / CDMA / HSPA / EVDO / LTE / 5G
LAUNCH	Announced Status	2020, August 03 Available. Released 2020, August 20	2020, September 30 Available. Released 2020, November 05	2020, September 30 Available. Released 2020, October 15
BODY	Dimensions	144 x 69.4 x 8.2 mm (5.67 x 2.73 x 0.32 in)	153.9 x 74 x 8.2 mm (Sub-6) or 8.5 mm (Sub-6 and mmWave) 168 g (5G Sub-6); 171 g (5G Sub-6 and mmWave) (5.93 oz)	144.7 x 70.4 x 8 mm (5.70 x 2.77 x 0.31 in) 151 g (5.33 oz)
	Weight	143 g (5.04 oz)		
	Build	Glass front (Gorilla Glass 3), plastic back, plastic frame	Glass front (Gorilla Glass 3), plastic back, plastic frame	Glass front (Gorilla Glass 6), aluminum back, aluminum frame
	SIM	Nano-SIM and/or eSIM	Nano-SIM and/or eSIM	Nano-SIM and/or eSIM
DISPLAY				
	Type	OLED, HDR	OLED, HDR	OLED, 90Hz, HDR10+
	Size	5.81 inches, 83.2 cm ² (~83.3% screen-to-body ratio)	6.2 inches, 95.7 cm ² (~84.1% screen-to-body ratio)	6.0 inches, 87.6 cm ² (~85.9% screen-to-body ratio)
	Resolution	1080 x 2340 pixels, 19.5:9 ratio (~443 ppi density)	1080 x 2340 pixels, 19.5:9 ratio (~413 ppi density)	1080 x 2340 pixels, 19.5:9 ratio (~432 ppi density)
	Protection	Corning Gorilla Glass 3 Always-on display	Corning Gorilla Glass 3 Always-on display	Corning Gorilla Glass 6 Always-on display
PLATFORM				
	OS	Android 10, upgradable to Android 11	Android 11	Android 11
	Chipset	Qualcomm SDM730 Snapdragon 730G (8 nm)	Qualcomm SM7250 Snapdragon 765G (7 nm)	Qualcomm SM7250 Snapdragon 765G (7 nm)
	CPU	Octa-core (2x2.2 GHz Kryo 470 Gold & 6x1.8 GHz Kryo 470 Silver)	Octa-core (1x2.4 GHz Kryo 475 Prime & 1x2.2 GHz Kryo 475 Gold & 6x1.8 GHz Kryo 475 Silver)	Octa-core (1x2.4 GHz Kryo 475 Prime & 1x2.2 GHz Kryo 475 Gold & 6x1.8 GHz Kryo 475 Silver)
	GPU	Adreno 618	Adreno 620	Adreno 620

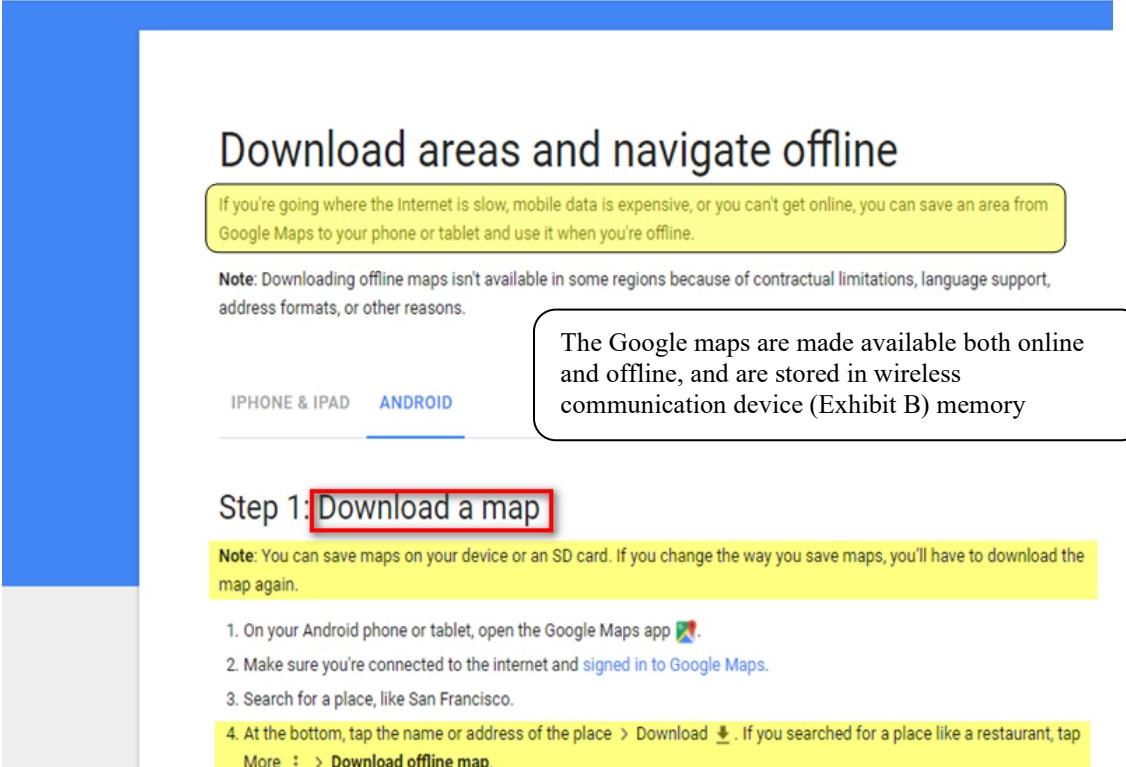
Attachment 4 (Processor of Google Pixel 4a, Pixel 4a 5G, and Pixel 5) at 1.

Claim 1	Corresponding Structure in Accused Systems
	<p>Using Turn-by-Turn Navigation with the Galaxy S20 Google Maps</p> <p>Time Needed : 8 minutes</p> <p>The following steps demonstrate the actual process of setting up and utilizing turn-by-turn navigation system with the Google Maps app on the new Samsung Galaxy S20 handset.</p> <p>Before you begin, verify and ensure that location is enabled on your phone. It has to be enabled so that your device can determine your current location.</p> <p>1. Tap to open the Google folder from the Home screen. A new screen consisting of Google-related apps and services will be displayed.</p>  <div data-bbox="889 665 1460 813" style="border: 1px solid black; padding: 5px;"> <p>Google Maps preloaded in the Wireless mobile communication devices (Exhibit B), such as Galaxy S20. Current location of the device is determined if location is enabled</p> </div> <p>Attachment 5 (how to use turn by turn Google map) at 1.</p>

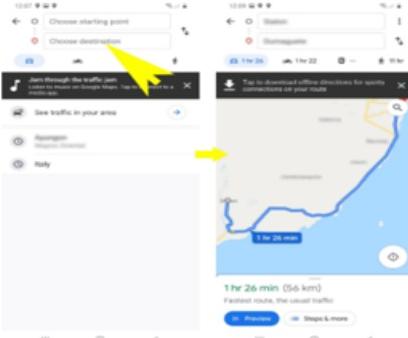
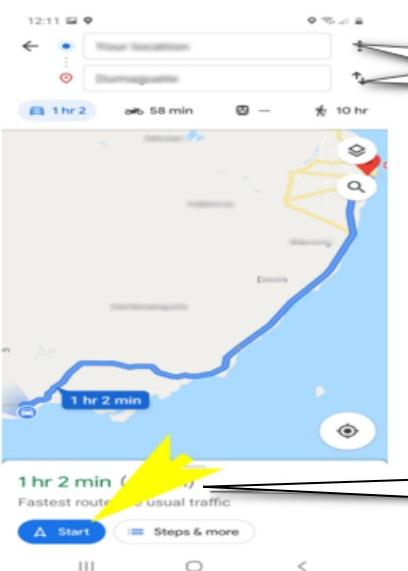
Claim 1	Corresponding Structure in Accused Systems
	 <p>2. Tap Maps to open Google Maps app. If this is the first time you use Google Maps on your Galaxy S20, you'll be prompted with a Welcome screen. If you see this screen, read and review the information then tap GOT IT to proceed.</p>  <p>Google Maps preloaded in the Wireless mobile communication devices (Exhibit B), such as Galaxy S20.</p> <p>Attachment 5 (how to use turn by turn google map) at 2&3.</p> <p>verizon</p> <p>Personal Business Shop Why Verizon Support</p> <p>Home > Support > Sony > Sony Xperia Z2 > Google Maps - Find Current Location</p> <h2>Google Maps™ - Find Current Location</h2> <p>Notes:</p> <ul style="list-style-type: none"> If the Google Maps app isn't already installed on your device, it can be downloaded from the Google Play Store™. For further assistance, refer to the Google Maps Help Center. <ol style="list-style-type: none"> From a Home screen, tap Apps. Tap Maps. Tap the My Location icon (located in the lower-right). <p>Wireless communication networks (e.g. Verizon, AT&T, T-Mobile, etc.) estimate/determine the location of the Wireless communication device (Exhibit B) on Google Maps.</p>

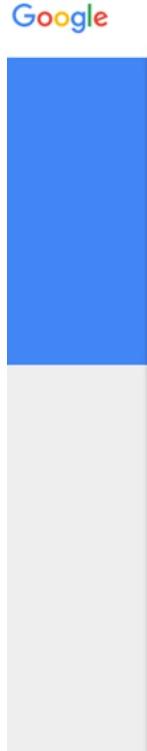
Claim 1	Corresponding Structure in Accused Systems
	<p>Attachment 6 (Find Current Location on Google map) at 1.</p>  <p>How Maps finds your current location</p> <p>Maps estimates where you are from sources like:</p> <ul style="list-style-type: none"> • GPS: This uses satellites and knows your location within a few meters. • Wi-Fi: The location of nearby Wi-Fi networks helps Maps know where you are. • Cell tower: Your connection to a cellular network can be accurate up to a few thousand meters.
	<p>Attachment 8 (How map finds your current location) at 2.</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>What the blue dot means</p> <p>The blue dot shows you where you are on the map. When Google Maps isn't sure about your location, you'll see a light blue circle around the blue dot. You might be anywhere within the light blue circle. The smaller the circle, the more certain the app is about your location.</p> <p>Notes:</p> <ul style="list-style-type: none"> • If the blue dot is not showing, or the dot is gray, this means that we can't find your current location and we're showing you the last location you visited. • If there's something between you and cell towers, like a parking garage or tall buildings, your blue dot might not be accurate. </div> <p>Attachment 8 (Current location shown on google map) at 3.</p> <div style="border: 1px solid #ccc; padding: 10px;"> <p>The following screenshot shows the My Location button at top right and the My Location blue dot in the center of the map:</p>  <p>Blue Dot indicating location the map</p> <p>Processor of the wireless communication device estimate the location of the wireless communication device (Exhibit B) from wireless communication network. The Blue dot showing estimated location.</p> <p>Geographical features cities, streets, etc., on Google Maps</p> </div> <p>Source: Location estimation on the Wireless communication device</p> <p>Attachment 22 (Location estimation on the Wireless communication device) at 10.</p>

Claim 1	Corresponding Structure in Accused Systems
	 <p>The screenshot shows the Verizon website with a red box highlighting the URL in the address bar: "Home > Support > Google > Google Pixel 4a > Google Maps - Download an Offline Map". Below this, a large red box highlights the title "Google Maps™ - Download an Offline Map". The page content is as follows:</p> <p>Download and Save a Map</p> <p>⚠️ Downloading offline maps isn't available in some regions.</p> <ol style="list-style-type: none"> 1. From a Home screen, tap Apps. 2. Tap Maps. 3. Tap the Search bar (located at the top) and enter the desired destination. 4. Tap the destination (located at the bottom). 5. Tap the Menu icon : (located in the upper-right). 6. Tap Save offline map. 7. Tap Save (located in the lower-right). 8. If preferred, enter a name for the map then tap Save. <p>View Saved Maps</p> <ol style="list-style-type: none"> 1. From a Home screen, tap Apps. 2. Tap Maps. 3. Tap the Menu icon ≡ (located in the upper-left). 4. Tap Your places. 5. Tap the appropriate map. <p>☞ For additional info on downloading maps, refer to this Google support article.</p> <p>Attachment 10 (Google Map-Download an offline map on Pixel 4a) at 1.</p>

Claim 1	Corresponding Structure in Accused Systems
	 <p>The screenshot shows the Google Maps interface. At the top, there's a search bar with the placeholder "Search Google Maps Help". Below the search bar, a large blue rectangular area covers the left side of the screen. In the center, the text "Download areas and navigate offline" is displayed in bold black font. Below this text is a yellow callout box containing the note: "If you're going where the Internet is slow, mobile data is expensive, or you can't get online, you can save an area from Google Maps to your phone or tablet and use it when you're offline." Further down, another note states: "Note: Downloading offline maps isn't available in some regions because of contractual limitations, language support, address formats, or other reasons." At the bottom of the main content area, there are two buttons: "IPHONE & IPAD" and "ANDROID", with "ANDROID" being underlined. To the right of this, in a separate rounded rectangle, is the text: "The Google maps are made available both online and offline, and are stored in wireless communication device (Exhibit B) memory".</p> <p>Step 1: Download a map</p> <p>Note: You can save maps on your device or an SD card. If you change the way you save maps, you'll have to download the map again.</p> <ol style="list-style-type: none"> 1. On your Android phone or tablet, open the Google Maps app . 2. Make sure you're connected to the internet and signed in to Google Maps. 3. Search for a place, like San Francisco. 4. At the bottom, tap the name or address of the place > Download  . If you searched for a place like a restaurant, tap More  > Download offline map. <p>Attachment 9 (Mapping information stored on wireless communication device) at 1.</p>

Claim 1	Corresponding Structure in Accused Systems
	<p>Get directions & show routes</p> <p>You can get directions for driving, public transit, walking, or biking on Google Maps. Whenever you find multiple routes, the best route to your destination is blue. Other routes are in gray on the map.</p> <p>Some directions in Google Maps are in beta, and may have limited availability. Always be cautious when using directions on Google Maps, remain aware of your surroundings at all times, and take necessary means to ensure safety of yourself and those around you. When in doubt, follow actual traffic regulations by confirming signage from the road or path that you are on when using directions.</p> <p>Android Computer iPhone & iPad</p> <hr/> <ol style="list-style-type: none"> 1. On your Android phone or tablet, open the Google Maps app . 2. Search for your destination or tap it on the map. 3. In the bottom left, tap Directions . 4. Choose one of the following: <ul style="list-style-type: none"> • Driving:  • Motorcycle:  • Transit:  • Walking:  • Rides:  • Cycling:  5. To get the list of directions, tap the bar at the bottom that shows travel time and distance. 6. To choose another route, tap it on the map. Each route shows the estimated travel time on the map. <p>Tip:</p> <ul style="list-style-type: none"> • For transit directions, choose a route, then tap the bar at the bottom that shows travel time and distance. • Not all cities have public transit directions in Google Maps. Learn which cities are covered. • For Driving  and Transit  directions, to pin your favorite trips, tap Pin  at the bottom. Learn more about how to pin your favorite trips. <p>Attachment 32 (Get directions & show routes) at 3.</p>

Claim 1	Corresponding Structure in Accused Systems
	<p>4. Tap the Choose destination field to specify your target location as a travel destination. On the next screen, simply type in the name of the place where you'd like to travel to. If prompted, select the correct location from the search result.</p>  <div data-bbox="873 369 1379 475" data-label="Text"> <p>Navigation Information displayed to user based on destination entered on the Wireless communication device (Exhibit B).</p> </div> <p>5. After entering your destination, tap the Start button at the bottom-left corner of the screen. That should prompt the app to start giving turn by turn navigation instructions.</p>  <div data-bbox="873 770 1240 855" data-label="Text"> <p>Current location and destination location on the map</p> </div> <div data-bbox="905 1003 1232 1098" data-label="Text"> <p>Geographical features cities, streets, or other point of interests, etc.</p> </div> <div data-bbox="930 1193 1191 1256" data-label="Text"> <p>Estimate time to reach the destination</p> </div> <p>Attachment 5 (Navigation based on destination entered on Google Maps) at 4 & 5.</p>

Claim 1	Corresponding Structure in Accused Systems
	 <p>Search Google Maps Help</p> <p>ANDROID IPHONE & IPAD</p> <h3>Start or stop navigation</h3> <ol style="list-style-type: none"> 1. Open the Google Maps app 🚗. 2. Search for a place or tap it on the map. 3. In the bottom right, tap Directions. If you touch and hold the button instead, you'll start navigation and can skip steps 4-6. 4. Optional: To add additional destinations, go to the top right and tap More ⋮ > Add stop. You can add up to 9 stops. When you are finished, tap Done. 5. Choose one of the following: <ul style="list-style-type: none"> • Driving: 🚙 • Transit: 🚍 • Walking: 🚶 • Rides: 🚎 • Cycling: 🚲 6. If other routes are available, they will be shown in gray on the map. To follow an alternate route, tap the gray line. 7. To start navigation, tap Start ⏪. If you see "Searching for GPS," your phone is trying to get a GPS signal. For example, you might be in or near a tunnel, parking garage, or other location where there's no GPS signal. 8. To stop or cancel navigation, go to the bottom right and tap Exit.

Attachment 11 (Navigation based on destination entered on Google Maps) at 1 & 2.

Use offline maps

After you download an area, use the Google Maps app just like you normally would.

- Get directions and see routes
- Use navigation
- Search for locations

If your Internet connection is slow or absent, Google Maps will use your offline maps to give you directions.

Notes:

- You can get driving directions offline, but not transit, bicycling, or walking directions. In your driving directions, you won't have traffic info, alternate routes, or lane guidance.
- To save cell data and battery life, use "Wi-Fi only" mode. In this mode, when you're not connected to Wi-Fi, Google Maps will only use data from the offline maps that you've downloaded. Before you use this mode, make sure you download offline maps. To turn on this mode, tap your profile picture or initial 🚩 > Settings⚙️ > turn on Wi-Fi only.

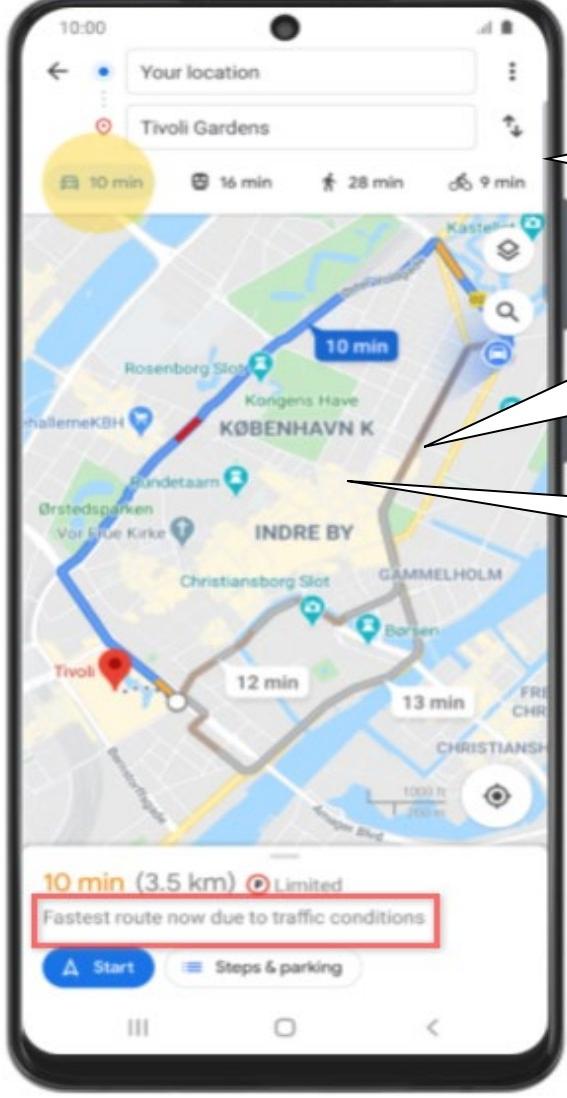
Manage offline maps

See a list of your offline maps

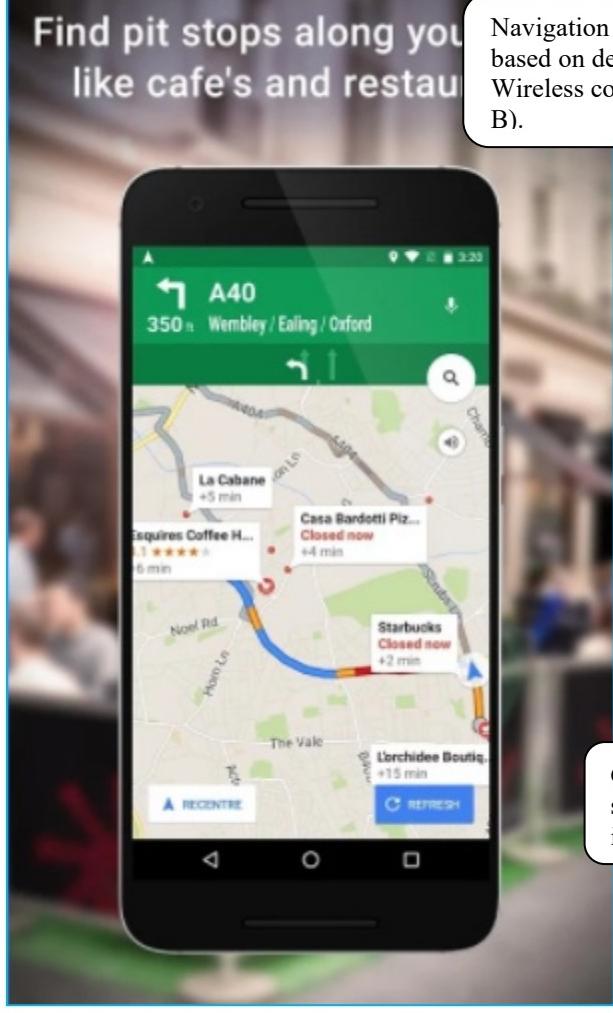
1. On your Android phone or tablet, open the Google Maps app 🚗.
2. Tap your profile picture or initial 🚩 > Offline maps.

You can select your own map to download, or view maps you've already downloaded.

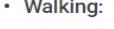
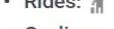
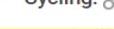
Attachment 31 (Download google map) at 2.

Claim 1	Corresponding Structure in Accused Systems
	<p data-bbox="1062 297 1465 445">Navigation Information displayed to user by the processor on the wireless communication device (Exhibit-B) based on destination entered by the user.</p> <p data-bbox="1029 502 1486 629">Navigation Information displayed to user based on destination entered on the Wireless communication device (Exhibit B).</p> <p data-bbox="1057 756 1449 819">Geographical features cities, streets, or other point of interests, etc.</p>

Attachment 25 (Use Google Maps - Samsung Galaxy S20 Ultra 5G) at 6.

Claim 1	Corresponding Structure in Accused Systems
	 <p>Navigation Information displayed to user based on destination entered on the Wireless communication device (Exhibit B).</p> <p>Current location on the map</p> <p>Geographical features cities, streets, or other point of interests, etc.</p>
	<p>Source: Navigation based on destination entered on Google Maps</p> <p>wherein the first processor further sends the user navigation information to the network as a number of segments, wherein at least one other processor outside the network updates the user navigation information in conformity with traffic congestion</p> <p>Plaintiff contends each item listed on Exhibit B corresponds to this claim limitation because each Exhibit-B item includes a processor. Wireless mobile communication device- including but not limited to Google's branded devices such as Google Pixel 5, pixel 4a 5G, pixel 4a, pixel 4 XL, pixel 4, pixel 3a XL, pixel 3a, pixel 3 XL, pixel 3, pixel 2, pixel 2 XL, pixel XL, pixel, pixel C or other (third-parties) branded devices such as Samsung Galaxy S20 Ultra, Galaxy S20 plus, Galaxy S20, Galaxy Z fold, Galaxy S10, Galaxy A series, etc. (refer Exhibit B for complete list) has a processor, for example, Quad-Core/ Octa-core processor.</p> <p>Further, the Google Maps utilizing the processor can send the user navigation information to the network as a number of segments as to receive the traffic information for the segments, it is required to send the navigation information to the network as a number of segments.</p> <p>As can be seen from the citations, the wireless communications device (Exhibit-B), having a processor, while navigating keeps on communicating the navigation information to the wireless communication network. The Google Maps hardware/software in the wireless communication network computes the average speed (numerical value) or average delays for each segment based on traffic congestion information for each segment. The updated information in response to the user's current navigation information is then transmitted by Google Maps hardware/software to</p>

Claim 1	Corresponding Structure in Accused Systems																																																																												
information accessible to the at least one other processor outside the network by computing a numerical value for the segments corresponding to the expected time to travel through the segments, updates the user navigation information in conformity with the numerical values for the segments, and sends the updated user navigation information to the wireless mobile communications device;	<p>the wireless communication device (Exhibit-B). The Google Map provides the user of the wireless communication device with the delays from traffic, summary of incidents and the average speed of each segment on the traffic page and also provides the user with the suggested navigation information with the received traffic information. The suggested route screen shows the proposed new route, outlining the original and suggested route, as well as listing the estimated time saved.</p> <p>The following exemplifies the existence of this limitation in Accused Systems:</p> <div style="text-align: center;"> <p>Preloaded application Google Map on the Wireless mobile device utilizes the processor coupled to the transceiver to estimates/receive the location on mobile wireless communications device by utilizing wireless communication network</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th></th> <th>NETWORK</th> <th>Technology</th> <th>GSM / HSPA / LTE</th> <th>GSM / HSPA / LTE / 5G</th> <th>GSM / CDMA / HSPA / EVDO / LTE / 5G</th> </tr> </thead> <tbody> <tr> <td>LAUNCH</td> <td>Announced Status</td> <td></td> <td>2020, August 03 Available. Released 2020, August 20</td> <td>2020, September 30 Available. Released 2020, November 05</td> <td>2020, September 30 Available. 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Released 2020, August 20	2020, September 30 Available. Released 2020, November 05	2020, September 30 Available. Released 2020, October 15	BODY	Dimensions		144 x 69.4 x 8.2 mm (5.67 x 2.73 x 0.32 in)	153.9 x 74 x 8.2 mm (Sub-6) or 8.5 mm (Sub-6 and mmWave)	144.7 x 70.4 x 8 mm (5.70 x 2.77 x 0.31 in)		Weight		143 g (5.04 oz)	168 g (5G Sub-6); 171 g (5G Sub-6 and mmWave) (5.93 oz)	151 g (5.33 oz)		Build		Glass front (Gorilla Glass 3), plastic back, plastic frame	Glass front (Gorilla Glass 3), plastic back, plastic frame	Glass front (Gorilla Glass 6), aluminum back, aluminum frame		SIM		Nano-SIM and/or eSIM	Nano-SIM and/or eSIM	Nano-SIM and/or eSIM	DISPLAY	Type	OLED, HDR	OLED, HDR	OLED, 90Hz, HDR10+		Size	5.81 inches, 83.2 cm ² (~83.3% screen-to-body ratio)	6.2 inches, 95.7 cm ² (~84.1% screen-to-body ratio)	6.0 inches, 87.6 cm ² (~85.9% screen-to-body ratio)		Resolution	1080 x 2340 pixels, 19.5:9 ratio (~443 ppi density)	1080 x 2340 pixels, 19.5:9 ratio (~413 ppi density)	1080 x 2340 pixels, 19.5:9 ratio (~432 ppi density)		Protection	Corning Gorilla Glass 3 Always-on display	Corning Gorilla Glass 3 Always-on display	Corning Gorilla Glass 6 Always-on display	PLATFORM	OS	Android 10, upgradable to Android 11	Android 11	Android 11		Chipset	Qualcomm SDM730 Snapdragon 730G (8 nm)	Qualcomm SM7250 Snapdragon 765G (7 nm)	Qualcomm SM7250 Snapdragon 765G (7 nm)		CPU	Octa-core (2x2.2 GHz Kryo 470 Gold & 6x1.8 GHz Kryo 470 Silver)	Octa-core (1x2.4 GHz Kryo 475 Prime & 1x2.2 GHz Kryo 475 Gold & 6x1.8 GHz Kryo 475 Silver)	Octa-core (1x2.4 GHz Kryo 475 Prime & 1x2.2 GHz Kryo 475 Gold & 6x1.8 GHz Kryo 475 Silver)		GPU	Adreno 618	Adreno 620	Adreno 620
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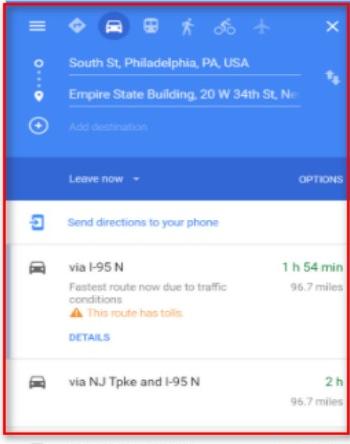
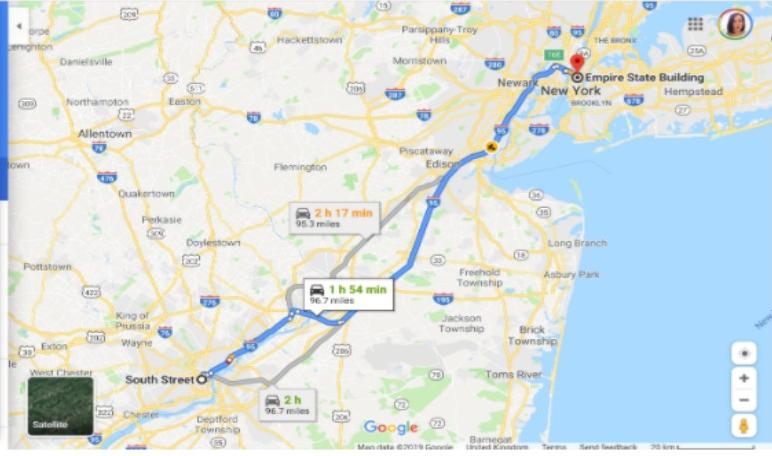
Claim 1	Corresponding Structure in Accused Systems
<p>Get directions & show routes</p> <p>You can get directions for driving, public transit, walking, or biking on Google Maps. Whenever you find multiple routes, the best route to your destination is blue. Other routes are in gray on the map.</p> <p>Some directions in Google Maps are in beta, and may have limited availability. Always be cautious when using directions on Google Maps, remain aware of your surroundings at all times, and take necessary means to ensure safety of yourself and those around you. When in doubt, follow actual traffic regulations by confirming signage from the road or path that you are on when using directions.</p> <p style="text-align: center;">Android Computer iPhone & iPad</p> <hr/> <ol style="list-style-type: none"> 1. On your Android phone or tablet, open the Google M 2. Search for your destination or tap it on the map. 3. In the bottom left, tap Directions . 4. Choose one of the following: <ul style="list-style-type: none"> • Driving:  • Motorcycle:  • Transit:  • Walking:  • Rides:  • Cycling:  5. To get the list of directions, tap the bar at the bottom that shows travel time and distance. 6. To choose another route, tap it on the map. Each route shows the estimated travel time on the map. <p>Tip:</p> <ul style="list-style-type: none"> • For transit directions, choose a route, then tap the bar at the bottom that shows travel time and distance. • Not all cities have public transit directions in Google Maps. Learn which cities are covered. • For Driving  and Transit  directions, to pin your favorite trips, tap Pin  at the bottom. Learn more about how to pin your favorite trips. <p>Attachment 32 (Get directions and show routes - Android - Google Maps Help) at 1.</p>	<p>The process of inputting a destination entry and initiating a navigation query at the Google Maps' client-side user interface (UI) at a user's communications device, and in response receiving navigation assistance (directions) from the remote Google Maps server.</p>

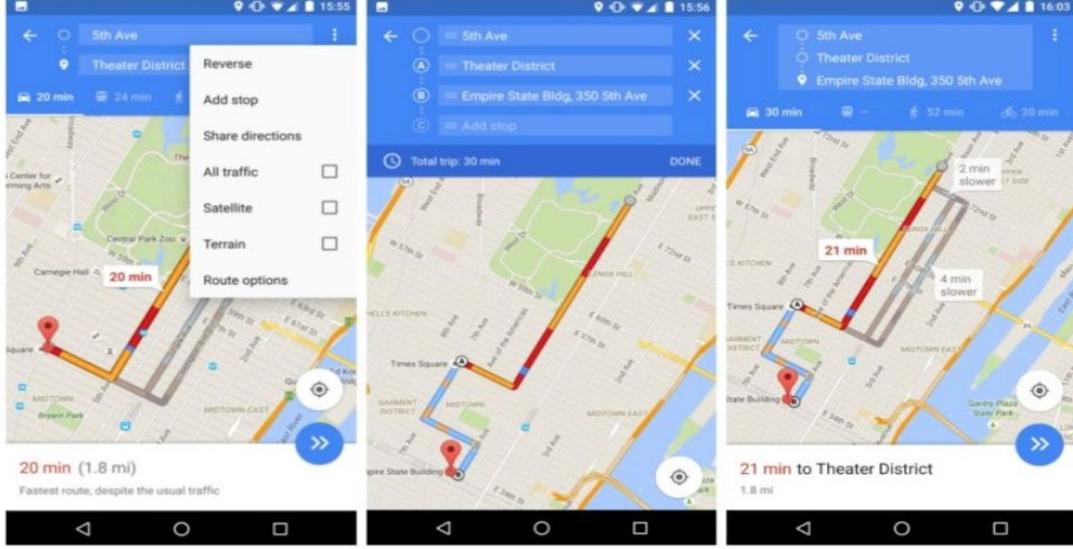
Claim 1	Corresponding Structure in Accused Systems
	<p>Save a route</p> <ol style="list-style-type: none"> 1. On your Android phone or tablet, open the Google Maps app . 2. Make sure you're connected to the Internet. 3. Search for your destination or tap it on the map. 4. In the bottom left, tap Directions . 5. From the top, choose your mode of transit. 6. Tap the white bar at the bottom. It's the one that shows the travel time and distance. 7. At the bottom, tap Save offline. <p>Tip:</p> <ul style="list-style-type: none"> • Your route is saved on your phone or tablet. Make sure to use the same phone or tablet when looking for a saved route. • Your saved route expires after 30 days. • Your route will show you the same mode of transit you chose when you saved the route. <p>Find a saved route</p> <ol style="list-style-type: none"> 1. On your Android phone or tablet, open the Google Maps app . 2. At the bottom, tap Saved offline route. <p>Tip:</p> <ul style="list-style-type: none"> • If you save a route from "Your location" and look up a saved route, the directions will start from the place where you saved the route. The directions won't start from your current location. • To get updated information like traffic, tap Refresh . • Turn-by-turn navigation isn't currently available for saved routes. To search for places and get turn-by-turn navigation, download an offline area. <p>Attachment 32 (Get directions & show routes) at 3.</p> <p>Update offline maps</p> <p>Offline maps that you downloaded on your phone or tablet need to be updated before they expire. When your offline maps expire in 15 days or less, Google Maps will try to update the area automatically when you're connected to Wi-Fi.</p> <p>If your offline maps aren't automatically updated, you can update them by following the steps below.</p> <p>From the notification</p> <ol style="list-style-type: none"> 1. In the "Update offline maps" notification, tap Update Now. 2. Tap the expired or expiring area on the list. 3. Tap Update. 4. The offline area will update <p>From anywhere else</p> <ol style="list-style-type: none"> 1. On your Android phone or tablet, open the Google Maps app . 2. Tap your profile picture or initial  > Offline maps. 3. Tap the expired or expiring area on the list. 4. Tap Update. 5. The offline area will update <p>Attachment 31 (Download google map) at 3.</p>

Claim 1	Corresponding Structure in Accused Systems
	<p>Get traffic or search for places along the way</p> <p>Important: This feature is only available on Android devices and in some countries.</p> <p>With Google Maps, you can get traffic for your drive, search for places easily, or quickly navigate to a common type of place, even if you don't enter a destination in Maps.</p> <div data-bbox="393 466 638 492" style="border: 2px solid red; padding: 5px;"> <h3>Get traffic for your drive</h3> <p>To view traffic for your drive:</p> <ol style="list-style-type: none"> 1. On your mobile device, open the Google Maps app 🚗. 2. At the bottom, tap Go 🚗. 3. Select one of the trip options that show up from your past activity. <p>Tip: If the selected trip doesn't show up, scroll to find and pin the trip you want.</p> <p>You'll find information like:</p> <ul style="list-style-type: none"> • How long it takes to drive to a suggested destination. Destinations are shown based on data from Google Account settings. • Recommended and alternate routes. • Traffic delays along the way, such as crashes or construction work. </div> <p>Learn how to use the Go tab.</p> <div data-bbox="393 800 610 825" style="border: 2px solid red; padding: 5px;"> <h3>Create a driving shortcut</h3> <p>To easily get traffic for your drive, create a driving shortcut for your mobile screen.</p> <ol style="list-style-type: none"> 1. On your mobile device, open the Google Maps app 🚗. 2. Tap your profile picture or initial 🚗. 3. Choose Settings > Navigation settings > Add Driving shortcut. </div> <div data-bbox="393 941 731 967" style="border: 2px solid red; padding: 5px;"> <h3>Get driving notifications with Bluetooth</h3> <p>If you have Bluetooth turned on and your phone or tablet is paired to your car, you'll get driving notifications when you start your car. To turn on notifications:</p> <ol style="list-style-type: none"> 1. On your mobile device, open the Google Maps app 🚗. 2. Tap your profile picture or initial 🚗. 3. Choose Settings > Navigation settings > Driving notifications. </div> <div data-bbox="393 1119 647 1144" style="border: 2px solid red; padding: 5px;"> <h3>Find events on your route</h3> <p>When you check the traffic on your route, you may find events highlighted, such as:</p> <ul style="list-style-type: none"> • Concerts • Parades • Marathons • Sporting events <p>On event days, you'll get updates about things like:</p> <ul style="list-style-type: none"> • Delays • Closures • Traffic conditions • Alternate routes <p>This info will go away automatically once the event is over. Explore other activities you can find in Maps.</p> </div> <div data-bbox="1121 388 1165 409" data-label="Section-Header"><h3>Help</h3></div> <div data-bbox="1121 430 1396 1058" data-label="List-Group"> <ul style="list-style-type: none"> • Get directions & show routes • Use navigation in the Google Maps app • Check your speed • Request a ride • Add a shortcut to places you visit often • Get traffic or search for places along the way • Use Google Assistant while navigating • Get train & bus departures • Get directions without unlocking your phone • Set a reminder to leave for your trip • Plan your commute or trip • Use Live View on Google Maps • Know when you're taken off suggested route • Use CarPlay to find stops on your route • Use Google Maps on your Apple Watch • How to use the Go tab </div>

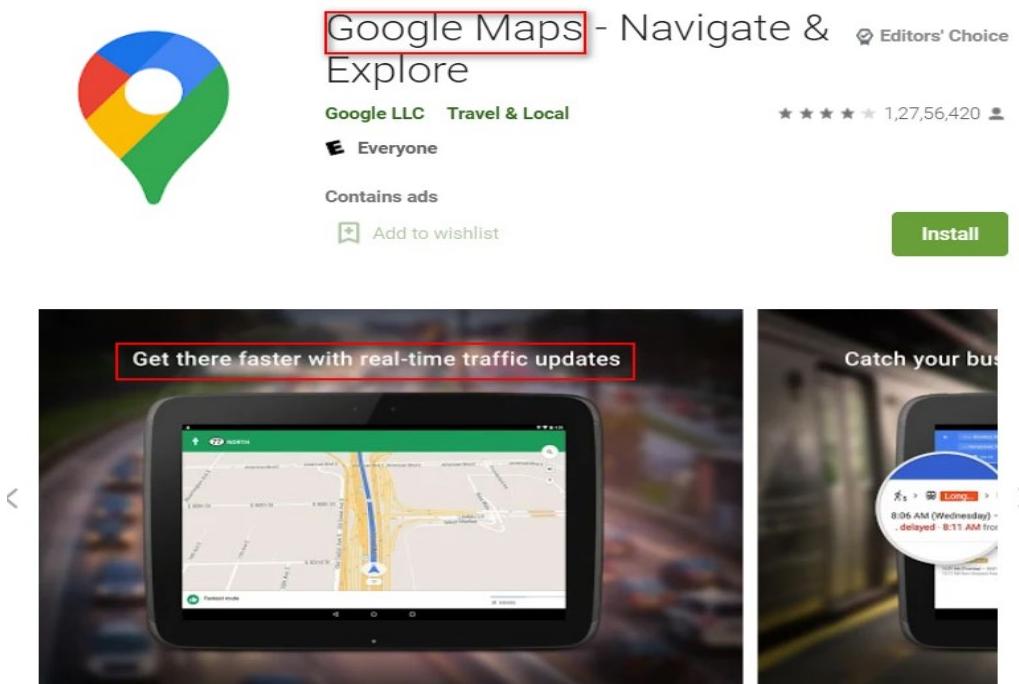
Attachment 26 (Get traffic or search for places along the way - Google Maps Help) at 1.

Claim 1	Corresponding Structure in Accused Systems
	<p>Putting it all together</p> <p>So how exactly does this all work in real life? Say you're heading to a doctor's appointment across town, driving down the road you typically take to get there. When you leave the house, traffic is flowing freely, with zero indication of any disruptions along the way. With Google Maps' traffic predictions combined with live traffic conditions, we let you know that if you continue down your current route, there's a good chance you'll get stuck in unexpected gridlock traffic about 30 minutes into your ride—which would mean missing your appointment. As a result, Google Maps automatically reroutes you using its knowledge about nearby road conditions and incidents—helping you avoid the jam altogether and get to your appointment on time.</p> <p>Predicting traffic and determining routes is incredibly complex—and we'll keep working on tools and technology to keep you out of gridlock, and on a route that's as safe and efficient as possible. ■</p> <p>Attachment 35 (How AI helps predict traffic and determine routes - Google Maps) at 2.</p>

Claim 1	Corresponding Structure in Accused Systems
<p>How to change your route on Google Maps on desktop</p> <p>1. Open Google Maps and type in the address or name of the location you wish to travel to before pressing Enter.</p> <p>2. Once the location comes up, click the Directions button beneath the info card. 3. Enter the starting point for your journey. This could be your home address or wherever you'll be departing from.</p> <p>4. Using the menu box above the journey information, choose which directions you would like to use - options for the purposes of this article include driving, public transit, cycling, and walking.</p> <p>5. On the map, you'll notice outlines for several routes. The default one, or the one Google Maps believes is best, will be highlighted blue.</p>   <p>Jennifer Still/Business Insider</p> <p>You can change your route by choosing one of the grey alternate ones, or dragging it to another route.</p> <p>6. To choose an alternate route, either click on a greyed-out route on the map or click on one of the other routes listed on the left-hand side menu. Note that you can also change routes by clicking on one and dragging it so that the directions will take you via certain roads.</p> <p>Attachment 37 (How to change the route on Google Map) at 3.</p> <div style="border: 1px solid black; padding: 10px; margin-top: 10px;"> <p>Google map Navigator hardware/software (Exhibit C) in the wireless network computes the estimated time delays (numerical value) for each segment corresponding to the time to travel through each segment. The updated information in response to user's current navigation information is then transmitted by the Google Map hardware/software (Exhibit C) to the wireless communication device (Exhibit-B)</p> </div>	

Claim 1	Corresponding Structure in Accused Systems
	

Attachment 24 (Traffic information summary on Google Maps) at 9.



Navigate your world faster and easier with Google Maps. Over 220 countries and territories mapped and hundreds of millions of businesses and places on the map. Get real-time GPS navigation, traffic, and transit info, and explore local neighborhoods by knowing where to eat, drink and go - no matter what part of the world you're in.

Get there faster with real-time updates

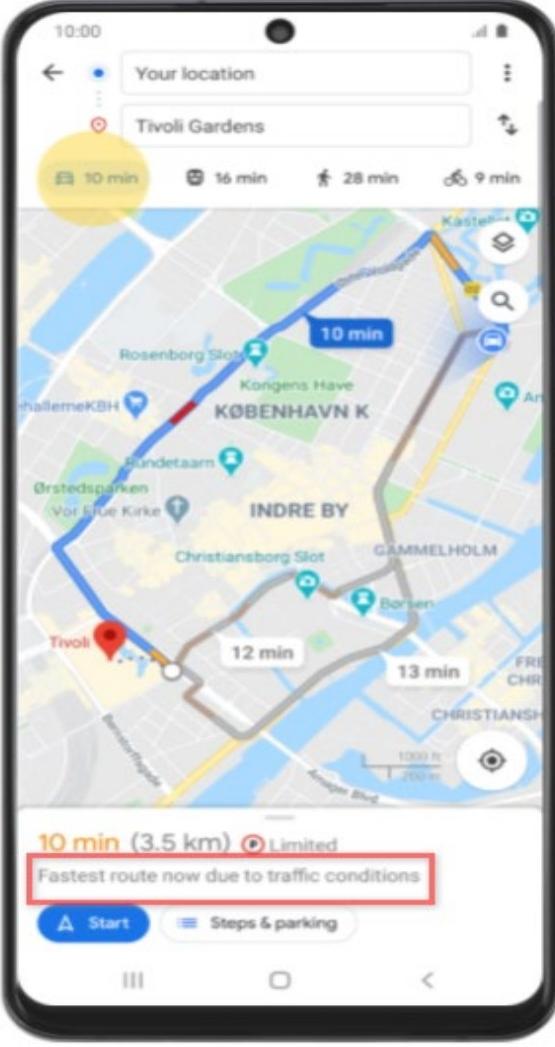
- Beat traffic with **real-time ETAs and traffic conditions**
- Catch your bus, train, or ride-share with **real-time transit info**
- Save time with **automatic rerouting based on live traffic, incidents, and road closures**

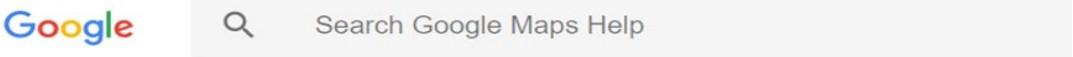
Attachment 23 (Google Maps – Navigation & Explore) at 1.

Claim 1	Corresponding Structure in Accused Systems
	<p>Find live traffic for buses</p> <ol style="list-style-type: none"> 1. On your Android phone or tablet, open the Google Maps app . 2. Search for your destination, then select transit directions. Read more about how to get directions. 3. If a bus route has Live Traffic for Buses information available, one of the following will be displayed: <ul style="list-style-type: none"> • Usual traffic • How many minutes are added for traffic <p>What the colors and symbols mean on the legend</p> <p>Nearby places of interest ▼</p> <p>Traffic ▲</p> <p>Traffic colors</p> <p>The color code shows you the speed of traffic on the road.</p> <ul style="list-style-type: none"> • Green: No traffic delays. • Orange: Medium amount of traffic. • Red: Traffic delays. The darker the red, the slower the speed of traffic on the road. <p>Note: Gray or blue lines on the map show your routes.</p> <p>Traffic incident symbols</p> <p>Traffic incidents include these types of delays:</p> <ul style="list-style-type: none"> • Crashes  • Construction  • Road closures  • Other incidents  <p>To find details about what happened, click or tap the icon.</p> <p>Note: For road closures, you'll find a dotted red line where the road is closed.</p> <p>Attachment 34 (View places, traffic, terrain, biking, and transit) at 2.</p>

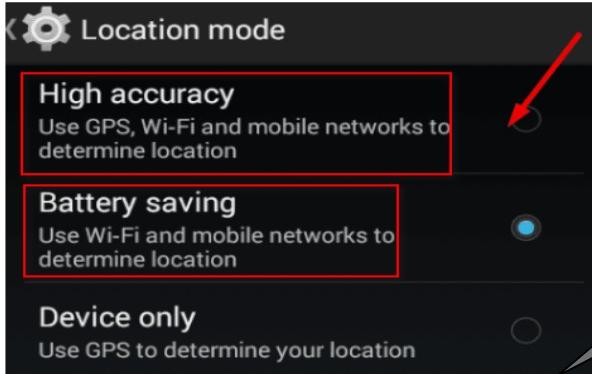
Claim 1	Corresponding Structure in Accused Systems
<p>Plan your commute or trip</p> <p>Before you start your drive or transit trip to home, work or other places, plan your trip and find useful info. This way, you can know when to leave, what traffic to expect, which route to take, and if there are any disruptions along the way.</p> <p>Android Computer iPhone & iPad</p> <p>Find traffic & transit info</p> <p>You can use Google Maps to quickly find all of your frequent trips in one tap. You'll get information about your ETA, the traffic reports and the accidents along the way.</p> <ol style="list-style-type: none"> 1. On your Android phone or tablet, open the Google Maps app . 2. At the bottom, tap Go . <p>Tip: To show the map, tap anywhere on the map or drag the tabs back down.</p> <p>Change the way you commute</p> <p>You can get access to directions for your frequent trips by pinning trips on the Go tab .</p> <ol style="list-style-type: none"> 1. On your Android phone or tablet, open the Google Maps app . 2. At the bottom, tap Go . 3. Search for your destination in the search bar at the top. 4. At the bottom, tap on "Directions." 5. At the top, select your transportation mode. 6. Select your preferred route. 7. At the bottom, tap Pin . <p>You can pin your trip and find it back in the Go tab next time you need it.</p> <p>Tip: Pinning only works with "Driving" and "Transit." Learn more about the Go tab .</p> <p>Check traffic now & later</p> <p>To reach your destination as quickly as possible, check typical traffic before you drive. You can avoid the busiest times of day.</p> <ol style="list-style-type: none"> 1. On your Android phone or tablet, open the Google Maps app . 2. Search for a destination, or tap a place on the map. 3. At the bottom, tap Directions. 4. At the top, tap Driving . 5. At the bottom, tap the white bar to display: <ul style="list-style-type: none"> • The current traffic on your route • Typical traffic by the hour and any slowdowns on the way <p>Change the mode of transportation for part of your trip</p> <p>Tip: Only available on mobile and in some locations.</p> <p>You can combine different modes of transportation, like driving, ride-sharing, or bicycling with transit on the same trip.</p> <p>Once you've selected your route and can view the directions, you may be able to change how you travel for part of your trip. The rest of the route, like transit departure times and total journey time, will be updated when you change the mode of transportation.</p>	

Attachment 36 (Plan your commute or trip) at 1&2.

Claim 1	Corresponding Structure in Accused Systems
	 <p data-bbox="1067 304 1328 544">Navigation Information displayed to user by the processor on the wireless communication device (Exhibit-B) based on destination entered by the user.</p> <p data-bbox="355 1311 1263 1345">Attachment 25 (Use Google Maps - Samsung Galaxy S20 Ultra 5G) at 6.</p>
<p>at least one second radio-frequency transceiver and an associated at least one second antenna of the wireless communications network to which the second radio-frequency transceiver is coupled; and</p>	<p>Plaintiff contends each Accused System includes at least one item listed on Exhibit A, each of which is a base station and each of which is coupled to at least one antenna. Base station includes radio-frequency transceivers designed and used for radio-frequency communication with at least one antenna. When base-station transceivers and antennas are in communication, they are coupled. Further, in addition to being so coupled, the transceivers and antenna of each Exhibit-A item are also, by placement within a base station, physically coupled.</p> <p>The cell of the wireless communications network include base stations for transmission and reception of wireless signals to and from the mobile wireless communication devices or UEs or user devices (mobile phones, laptops, tablets, PDAs etc.). These base stations are, therefore, RF transceivers. Also, these base stations are coupled with at least one antenna for the function of transmission and reception.</p> <p>The following exemplifies this limitation's existence in Accused Systems:</p>

Claim 1	Corresponding Structure in Accused Systems
	 <p>How Maps finds your current location</p> <p>Maps estimates where you are from sources like:</p> <ul style="list-style-type: none"> • GPS: This uses satellites and knows your location within a few meters. • Wi-Fi: The location of nearby Wi-Fi networks helps Maps know where you are. • Cell tower: Your connection to a cellular network can be accurate up to a few thousand meters. <p>Attachment 8 (How map find your current location) at 2.</p> <p>Knowing where the user is allows your application to be smarter and deliver better information to the user. When developing a location-aware application for Android, you can utilize GPS and Android's Network Location Provider to acquire the user location. Although GPS is most accurate, it only works outdoors, it quickly consumes battery power, and doesn't return the location as quickly as users want.</p> <p>Android's Network Location Provider determines user location using cell tower and Wi-Fi signals, providing location information in a way that works indoors and outdoors, responds faster, and uses less battery power. To obtain the user location in your application, you can use both GPS and the Network Location Provider, or just one.</p> <p>Attachment 12 (Location of the device determined using cell tower) at 1&2.</p> <div style="border: 1px solid black; padding: 10px; width: fit-content; margin-left: auto; margin-right: auto;"> <p>Google Maps provides location information based on cell towers/Wi-Fi nodes which form part of cellular communication network. These cell towers are radio frequency transceivers with antenna (Exhibit A).</p> </div> <p>Introduction</p> <p>The Geolocation API returns a location and accuracy radius based on information about cell towers and WiFi nodes that the mobile client can detect. This document describes the protocol used to send this data to the server and to return a response to the client.</p> <p>Communication is done over HTTPS using POST. Both request and response are formatted as JSON, and the content type of both is <code>application/json</code>.</p> <p>Attachment 17 (Cell Towers/Wi-Fi Nodes (RF transceivers) in a wireless communication network) at 1</p>

Claim 1	Corresponding Structure in Accused Systems
	<p>The first parameter in <code>requestLocationUpdates()</code> is the type of location provider to use (in this case, the Network Location Provider for cell tower and Wi-Fi based location). You can control the frequency at which your listener receives updates with the second and third parameter—the second is the minimum time interval between notifications and the third is the minimum change in distance between notifications—setting both to zero requests location notifications as frequently as possible. The last parameter is your <code>LocationListener</code>, which receives callbacks for location updates.</p> <p>To request location updates from the GPS provider, use <code>GPS_PROVIDER</code> instead of <code>NETWORK_PROVIDER</code>. You can also request location updates from both the GPS and the Network Location Provider by calling <code>requestLocationUpdates()</code> twice—once for <code>NETWORK_PROVIDER</code> and once for <code>GPS_PROVIDER</code>.</p> <p>Requesting User Permission</p> <p>In order to receive location updates from <code>NETWORK_PROVIDER</code> or <code>GPS_PROVIDER</code>, you must request the <code>ACCESS_FINE_LOCATION</code> permission by declaring either the <code>ACCESS_COARSE_LOCATION</code> or <code>ACCESS_FINE_LOCATION</code> permission, respectively, in your Android manifest file. Without these permissions, your application will fail at runtime when requesting location updates.</p> <p>If you are using both <code>NETWORK_PROVIDER</code> and <code>GPS_PROVIDER</code>, then you need to request only the <code>ACCESS_FINE_LOCATION</code> permission, because it includes permission for both providers. Permission for <code>ACCESS_COARSE_LOCATION</code> allows access only to <code>NETWORK_PROVIDER</code>.</p> <p>Attachment 12 (Location is estimated using cell tower/wi-fi network) at 3 & 4.</p> <p>Help your phone get a more accurate location (Google Location Services a.k.a. Google Location Accuracy)</p> <p>Turn your phone's location accuracy on or off</p> <ol style="list-style-type: none"> 1. Open your device's Settings app. 2. Tap Location > Advanced > Google Location Accuracy. 3. Turn Improve Location Accuracy on or off. <p>When Google Location Accuracy is on</p> <p>When you have Google Location Accuracy turned on, your phone uses these sources to get the most accurate location:</p> <ul style="list-style-type: none"> • GPS • Wi-Fi • Mobile networks • Sensors <p>Wireless communication device receive the location of the Wireless communication device (Exhibit B) on Google Map from Wireless communication networks (e.g. Verizon, AT&T, T-Mobile, etc.)</p> <p>When Google Location Accuracy is off</p> <p>Let your phone scan for nearby networks or devices</p> <p>To help apps get better location info, you can let your phone scan for nearby Wi-Fi access points or Bluetooth devices.</p> <ol style="list-style-type: none"> 1. Open your device's Settings app. 2. Tap Location > Wi-Fi and Bluetooth scanning. 3. Turn Wi-Fi scanning or Bluetooth scanning on or off.

Claim 1	Corresponding Structure in Accused Systems
	<p>Attachment 21 (Manage your Pixel phone's location settings) at 2.</p> <ol style="list-style-type: none"> 1. On your Android device, go to Settings 2. Tap Location and re-enable your location services 3. Select Mode High accuracy  <div data-bbox="1204 466 1470 762" style="border: 1px solid black; padding: 10px; width: fit-content; margin-left: 20px;"> <p>The user of the wireless device can select the method of the location estimation</p> </div> <p>On some phone models, this option can be found under the Advanced Settings option.</p> <p>Select Advanced Settings and enable your device to improve positioning accuracy by allowing apps to scan for Wi-Fi networks and Bluetooth devices at any time, even if Wi-Fi or Bluetooth is disabled.</p>  <p>Attachment 33 (Google Maps Not Updating Location) at 4.</p>

Claim 1	Corresponding Structure in Accused Systems
<p>a second processor coupled to the at least one second radio-frequency transceiver programmed to acquire the information indicative of a location of the wireless mobile communications device,</p>	<p>Plaintiff contends that Google Maps has one or more processors that determine(s) the location of wireless mobile communications devices. These processors communicatively coupled to the second RF transceiver(s) and are programmed to determine a wireless mobile communication device's location.</p> <p>Wireless mobile communications devices can, through the second RF transceiver(s), communicatively connect to and use Google Maps. Google Maps' processors can determine the device's current location and direction from that location/source to any destination. The processors are programmed to estimate the location of the device from 3 sources: GPS (GPS uses satellites and knows your location within a few meters), Wi-Fi (the location of nearby Wi-Fi networks helps Maps know where you are), and cell towers (cell tower can be accurate up to a few thousand meters).</p> <p>The following exemplifies this limitation's existence in Accused Systems:</p>  <p>How Maps finds your current location</p> <p>Maps estimates where you are from sources like:</p> <ul style="list-style-type: none"> • GPS: This uses satellites and knows your location within a few meters. • Wi-Fi: The location of nearby Wi-Fi networks helps Maps know where you are. • Cell tower: Your connection to a cellular network can be accurate up to a few thou

Attachment 8 (How map find your current location) at 2.

GPS Location Settings - Android™

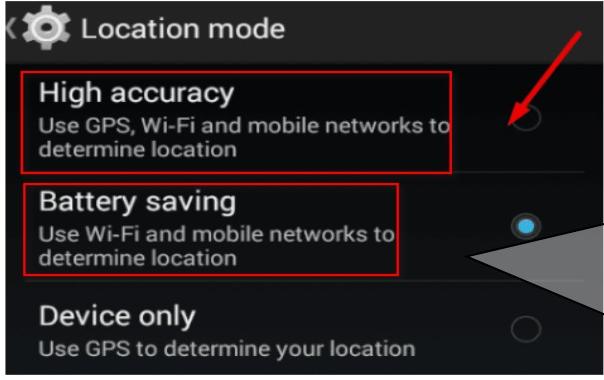
For more info on Android GPS location settings, see this [support page](#).

- From a Home screen, navigate: **Apps > Settings > Location.**
→ If unavailable, navigate: **Settings > Security & Location.**
- If available, tap **Location**.
- Ensure the Location switch is set to on .
- Tap 'Mode' or 'Locating method' then select one of the following:
→ Options vary depending on device.
 - **High accuracy (Battery usage: high):** Uses GPS, Wi-Fi, and mobile networks to estimate location.
 - **Power saving / Battery saving (Battery usage: low):** Uses Wi-Fi and mobile networks to estimate location.
 - **GPS only / Device only / Device sensors (Battery usage: moderate):** Uses GPS to estimate location.
- If presented with a Location consent prompt, tap **Agree**.

Attachment 18 (method of estimate the location of the device) at 1.

Claim 1	Corresponding Structure in Accused Systems
	<p>Settings</p> <p>Location</p> <p>Google map estimates the location of the device from 3 sources: GPS, Wi-Fi and cell towers</p> <p>Location services use a combination of GPS, mobile network and Wi-Fi to determine the location of your device.</p> <ol style="list-style-type: none"> 1. From Settings, tap Location. 2. Tap to turn on Location services. <p> TIP Some apps require location services be turned on for full functionality.</p> <p>Attachment 15 (Turn ON/OFF the location setting) at 161.</p> <p>Knowing where the user is allows your application to be smarter and deliver better information to the user. When developing a location-aware application for Android, you can utilize GPS and Android's Network Location Provider to acquire the user location. Although GPS is most accurate, it only works outdoors, it quickly consumes battery power, and doesn't return the location as quickly as users want.</p> <p>Android's Network Location Provider determines user location using cell tower and Wi-Fi signals, providing location information in a way that works indoors and outdoors, responds faster, and uses less battery power. To obtain the user location in your application, you can use both GPS and the Network Location Provider, or just one.</p> <p>Attachment 12 (Location of the device determine using cell tower) at 1&2.</p> <p>Introduction</p> <p>Google Maps provides location information based on cell towers/Wi-Fi nodes which form part of cellular communication network. These cell towers are radio frequency transceivers with antenna (Exhibit A).</p> <p>The Geolocation API returns a location and accuracy radius based on information about cell towers and WiFi nodes that the mobile client can detect. This document describes the protocol used to send this data to the server and to return a response to the client.</p> <p>Communication is done over HTTPS using POST. Both request and response are formatted as JSON, and the content type of both is <code>application/json</code>.</p> <p>Attachment 17 (Cell Towers/Wi-Fi Nodes (RF transceivers) in a wireless communication network) at 1.</p>

Claim 1	Corresponding Structure in Accused Systems
	<p>The first parameter in <code>requestLocationUpdates()</code> is the type of location provider to use (in this case, the Network Location Provider for cell tower and Wi-Fi based location). You can control the frequency at which your listener receives updates with the second and third parameter—the second is the minimum time interval between notifications and the third is the minimum change in distance between notifications—setting both to zero requests location notifications as frequently as possible. The last parameter is your <code>LocationListener</code>, which receives callbacks for location updates.</p> <p>To request location updates from the GPS provider, use <code>GPS_PROVIDER</code> instead of <code>NETWORK_PROVIDER</code>. You can also request location updates from both the GPS and the Network Location Provider by calling <code>requestLocationUpdates()</code> twice—once for <code>NETWORK_PROVIDER</code> and once for <code>GPS_PROVIDER</code>.</p> <p>Requesting User Permissions</p> <p>In order to receive location updates from <code>NETWORK_PROVIDER</code>, you must declare either <code>ACCESS_COARSE_LOCATION</code> or <code>ACCESS_FINE_LOCATION</code> permission, respectively, in your Android manifest file. Without these permissions, your application will fail at runtime when requesting location updates.</p> <p>If you are using both <code>NETWORK_PROVIDER</code> and <code>GPS_PROVIDER</code>, then you need to request only the <code>ACCESS_FINE_LOCATION</code> permission, because it includes permission for both providers. Permission for <code>ACCESS_COARSE_LOCATION</code> allows access only to <code>NETWORK_PROVIDER</code>.</p> <p>Attachment 12 (Location is estimated using cell tower/wi-fi network) at 3 & 4.</p> <p>Help your phone get a more accurate location (Google Location Services a.k.a. Google Location Accuracy)</p> <p>Turn your phone's location accuracy on or off</p> <ol style="list-style-type: none"> 1. Open your device's Settings app. 2. Tap Location > Advanced > Google Location Accuracy. 3. Turn Improve Location Accuracy on or off. <p>When Google Location Accuracy is on</p> <p>When you have Google Location Accuracy turned on, your phone uses these sources to get the most accurate location:</p> <ul style="list-style-type: none"> • GPS • Wi-Fi • Mobile networks • Sensors <p>Wireless communication device receive the location of the Wireless communication device (Exhibit B) on Google Map from Wireless communication networks (e.g. Verizon, AT&T, T-Mobile, etc.)</p> <p>When Google Location Accuracy is off</p> <p>Let your phone scan for nearby networks or devices</p> <p>To help apps get better location info, you can let your phone scan for nearby Wi-Fi access points or Bluetooth devices.</p> <ol style="list-style-type: none"> 1. Open your device's Settings app. 2. Tap Location > Wi-Fi and Bluetooth scanning. 3. Turn Wi-Fi scanning or Bluetooth scanning on or off. <p>Attachment 21 (Manage your Pixel phone's location settings) at 2.</p>

Claim 1	Corresponding Structure in Accused Systems
	<p>1. On your Android device, go to Settings 2. Tap Location and re-enable your location services 3. Select Mode High accuracy</p>  <div data-bbox="1237 439 1416 616" style="border: 1px solid black; border-radius: 10px; padding: 5px; margin-left: 20px;"> The user of the wireless device can select the method of the location estimation </div> <p>On some phone models, this option can be found under the Advanced Settings option.</p> <p>Select Advanced Settings and enable your device to improve positioning accuracy by allowing apps to scan for Wi-Fi networks and Bluetooth devices at any time, even if Wi-Fi or Bluetooth is disabled.</p>  <p>Attachment 33 (Google Maps Not Updating Location) at 4.</p>

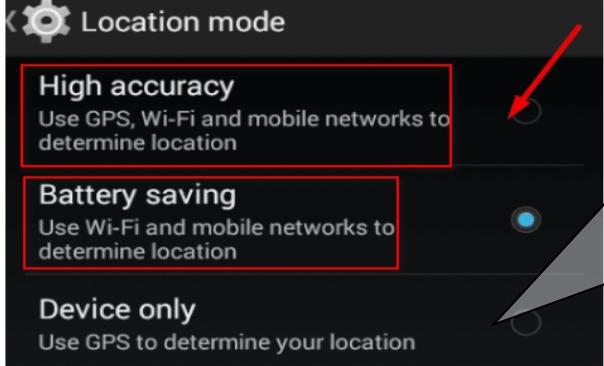
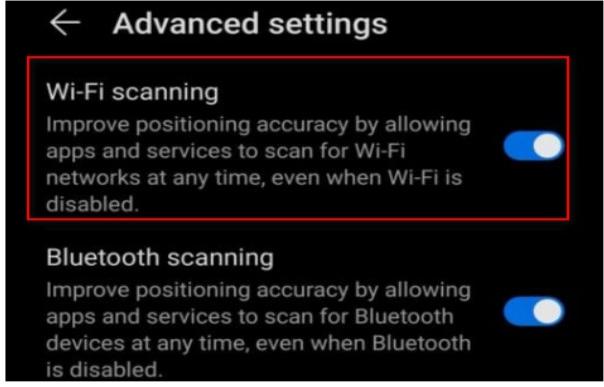
Claim 1	Corresponding Structure in Accused Systems
	<p>By default the “Location setting” is set at “High accuracy” mode, wherein, for example, accuracy of location of a communications device determined based on locations of nearby Wi-Fi network infrastructure (access points or hotspots) is further enhanced or fine-tuned by Google Maps Server additionally using the said communications device’s GPS location and the location data obtained from the mobile network (Cell tower information and/or Location of the communications device determined through the Assisted-GPS method by the said mobile network) serving the said communications device.</p>

Attachment 45 (Google Maps_Android app_Location settings) at 1.

Claim 1	Corresponding Structure in Accused Systems
<h2 data-bbox="372 255 1323 312">Find and improve your location's accuracy</h2> <p data-bbox="372 329 1454 426">Sometimes Google Maps might have trouble finding where you are located. If the GPS location of your blue dot on the map is inaccurate or the blue dot is not showing up, here are some things you can do to help fix the problem.</p> <p data-bbox="372 449 1188 481">Tip: This will also improve your search results and make them more relevant to you.</p> <hr/> <p data-bbox="393 557 812 582">Computer Android iPhone & iPad</p> <hr/> <h3 data-bbox="372 677 1008 720">See your current location on the map</h3> <ol style="list-style-type: none"> <li data-bbox="381 741 1041 772">1. On your Android phone or tablet, open the Google Maps app . <li data-bbox="381 798 1442 857">2. You'll see a blue dot, which shows where you are. If you don't see a blue dot, go to the bottom and tap Your location . <h3 data-bbox="372 925 1013 967">How Maps finds your current location</h3> <p data-bbox="372 988 858 1015">Maps estimates where you are from sources like:</p> <ul style="list-style-type: none"> <li data-bbox="381 1036 1465 1100">GPS: This uses satellites and knows your location up to around 20 meters. Note: When you're inside buildings or underground, the GPS is sometimes inaccurate. <li data-bbox="381 1110 1155 1142">Wi-Fi: The location of nearby Wi-Fi networks helps Maps know where you are. <li data-bbox="381 1153 1323 1184">Cell tower: Your connection to a cellular network can be accurate up to a few thousand meters. <p data-bbox="355 1195 1507 1254">Attachment 46 (Find and improve your location's accuracy - Android - Google Maps Help at 1.)</p>	

Claim 1	Corresponding Structure in Accused Systems
	<p>From your devices</p> <p>Many devices, like phones or computers, can work out their precise location. You can allow Google and other apps to provide you with useful features based on where your device is located. For example, if you're running late to meet your friends, you'll probably want to use a navigation app to know the quickest way to get to your destination. To get turn-by-turn directions, you may need to turn on your device's location and give the app the permission to access it. Or for some searches like "coffee shop", "bus stop" or "atm", results will usually be more helpful when precise location is available.</p> <p>On your Android device, if you choose to turn on your device location, you can use features like navigation, giving an app access to your current location, or find your phone. You can also choose which apps have permission to use your device's location with simple controls that let you turn the permission on or off for individual apps. On Android, you can see when an app is requesting to use your phone's GPS-based location when the top of your screen shows Location  Learn more</p> <p>Google Location Services</p> <p>On most Android devices, Google, as the network location provider, provides a location service called Google Location Services (GLS), known in Android 9 and above as Google Location Accuracy. This service aims to provide a more accurate device location and generally improve location accuracy. Most mobile phones are equipped with GPS, which uses signals from satellites to determine a device's location – however, with Google Location Services, additional information from nearby Wi-Fi, mobile networks, and device sensors can be collected to determine your device's location. It does this by periodically collecting location data from your device and using it in an anonymous way to improve location accuracy.</p> <p>You can disable Google Location Services at any time in your device's location settings. Your device's location will continue to work even if GLS is turned off, but the device will rely only on GPS to estimate device location for apps with the necessary permission. Google Location Services is distinct from your device's location setting. Learn more</p> <p>The settings and permissions on Android control whether your device sensors (like GPS) or network-based location (like GLS) are used to determine your location and which apps have access to that location. They do not impact how websites and apps might estimate your location in other ways, such as from your IP Address.</p> <p>Attachment 44 (How Google uses location information – Privacy & Terms – Google) at 2 &3.</p>

Claim 1	Corresponding Structure in Accused Systems
	<p>If you use an older Android version</p> <p>Choose location settings (Android 9.0)</p> <p>To change location settings:</p> <ol style="list-style-type: none"> 1. Open your device's Settings app. 2. Tap Security & Location > Location. <ul style="list-style-type: none"> • If you have a work profile, tap Advanced. <p>Then, choose an option:</p> <ul style="list-style-type: none"> • Turn Location on or off: Tap Location. • Scan for nearby networks: Tap Advanced > Scanning. Turn Wi-Fi scanning or Bluetooth scanning on or off. • Turn emergency location service on or off: Tap Advanced > Google Emergency Location Service. Turn Emergency Location Service on or off. <p>Choose location mode (Android 4.4–8.1)</p> <p>You can choose your location mode based on accuracy, speed, and battery use.</p> <ol style="list-style-type: none"> 1. Open your phone's Settings app. 2. Tap Security & Location > Location. If you don't see "Security & Location," tap Location. 3. <u>Tap Mode. Then pick:</u> <ul style="list-style-type: none"> • High accuracy: Use GPS, Wi-Fi, mobile networks, and sensors to get the most accurate location. Use Google Location Services to help estimate your phone's location faster and more accurately. • Battery saving: Use sources that use less battery, like Wi-Fi and mobile networks. Use Google Location Services to help estimate your phone's location faster and more accurately. • Device only: Use only GPS. Don't use Google Location Services to provide location information. This can estimate your phone's location more slowly and use more battery. <p>Choose location access (Android 4.1–4.3)</p> <p>You can control what location information your phone can use.</p> <ol style="list-style-type: none"> 1. Open your phone's Settings app. 2. Under "Personal," tap Location access. 3. At the top of the screen, turn Access to my location on or off. <ul style="list-style-type: none"> • When location access is on, pick either or both of: <ul style="list-style-type: none"> • GPS satellites: Lets your phone estimate its location from satellite signals, like a GPS device in a car. • Wi-Fi & mobile network location: Lets your phone use Google Location Services to help estimate its location faster, with or without GPS. • When location access is off: <p>Your phone can't find its precise location or share it with any apps.</p> <p>Tip: If you have a tablet that more than one person uses, each person can have different location access settings.</p> <p>Attachment 40 (Manage your Pixel phone's location settings) at 3 & 4.</p>

Claim 1	Corresponding Structure in Accused Systems
	<p>1. On your Android device, go to Settings 2. Tap Location and re-enable your location services 3. Select Mode High accuracy</p>  <p>The user of the wireless device can select the method of the location estimation</p> <p>On some phone models, this option can be found under the Advanced Settings option.</p> <p>Select Advanced Settings and enable your device to improve positioning accuracy by allowing apps to scan for Wi-Fi networks and Bluetooth devices at any time, even if Wi-Fi or Bluetooth is disabled.</p>  <p>Attachment 33 (Google Maps Not Updating Location) at 4.</p>

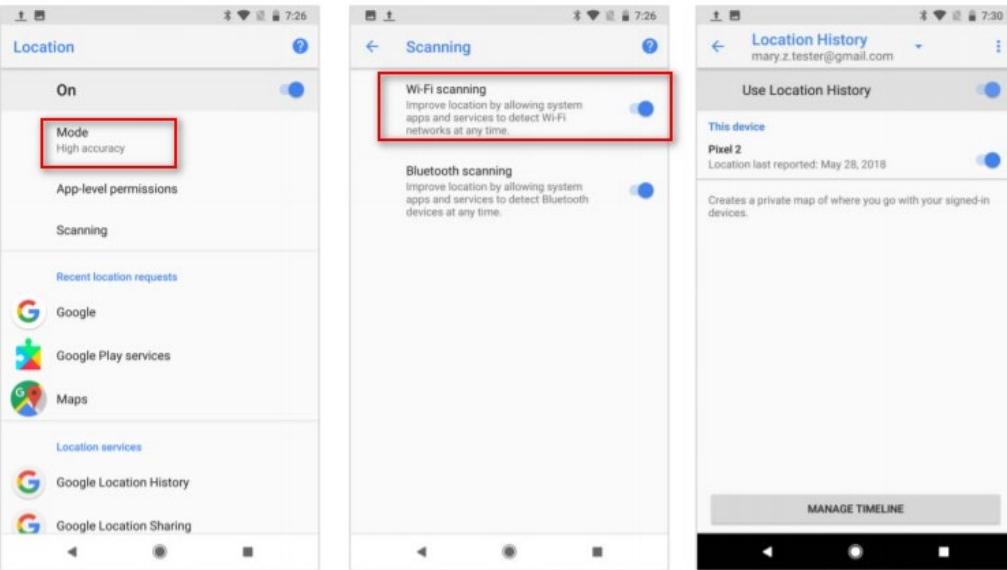
Claim 1	Corresponding Structure in Accused Systems		
	Description	Opt-In / Opt-Out	User Choices
LOCATION SERVICES	"Use Google's location service to help apps determine your location. Anonymous location data will be sent to Google when your device is on."	Opt-Out	"YES, I'M IN" or "SKIP"
LOCATION ACCURACY	Three Modes - "High accuracy", "Battery saving", and "Device only". Default setting: "High accuracy uses GPS, Wi-Fi, Bluetooth, or cellular networks to determine location".	Opt-Out	Toggle icon (right and colored for on, left and gray for off). This setting not shown during Android set-up.
LOCATION SCANNING	"Improve location accuracy by allowing apps and services to scan for Wi-Fi and Bluetooth, even when those settings are off."	Opt-Out	Toggle icon (right and colored for on, left and gray for off).
LOCATION HISTORY	"Allows Google to store a history of your location data from all devices where you are logged into your Google Account and have enabled Location Reporting. Location History and Location Reporting data may be used by any Google app or service."	Opt-Out	"YES, I'M IN" or "NO THANKS" In the context of "Give your new Assistant permission to help you"

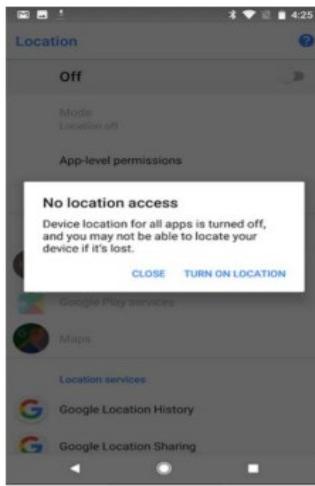
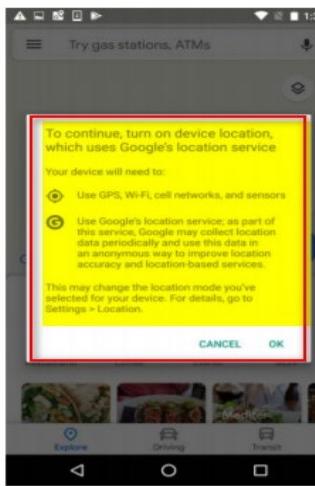
Figure 1: Four Android settings and services that relate to location information collection.¹

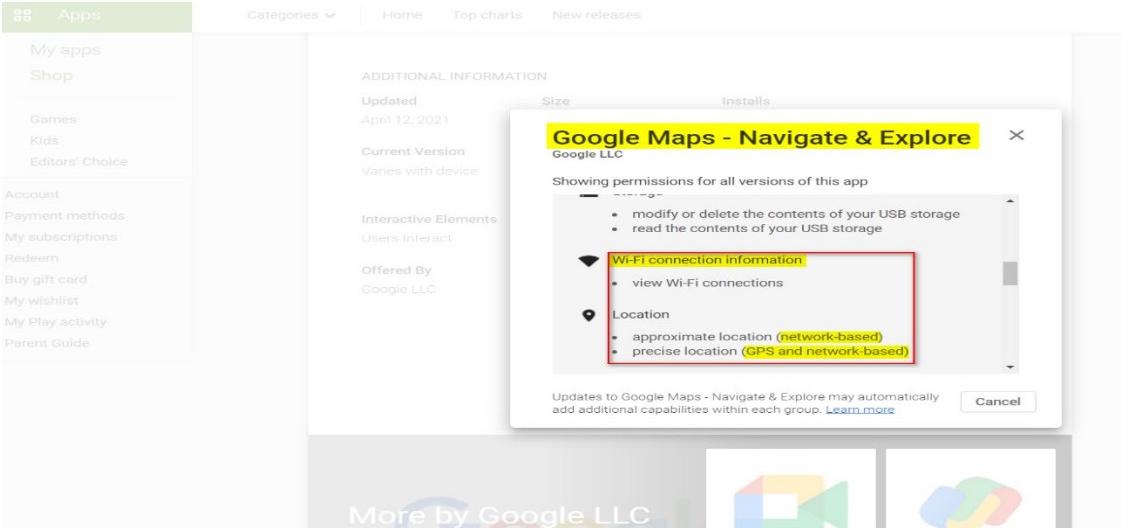
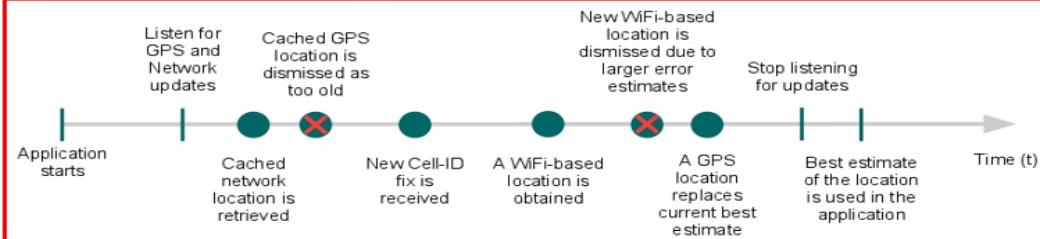
Google Location Services
Google Location Services (GLS) operate at a device level and rely on sensors such as GPS, Wi-Fi, the cellular radio, and other technologies included in mobile devices to position a user in the world. If a user keeps the default settings prompted by Google, Location Services is enabled, Location Accuracy will be set to "High Accuracy"² and Location Scanning will be enabled for both Wi-Fi base stations and Bluetooth Beacons, regardless of a user's choice to turn Wi-Fi or Bluetooth on. The implications of user choices among the various Location Services settings are significant, but not intuitive, including:

- With Location Services turned on, Location Accuracy set to "Device only" and Location Scanning turned off, an Android device will only use GPS to provide the location of an Android device.
- When Location Accuracy is set to "High accuracy" and Location Scanning is enabled (the default setting for new device setup), an Android device will use sources including Wi-Fi, Bluetooth, and cellular radio to improve the accuracy of the device's position.

Attachment 38 (Google, Android and Location Tracking) at 2.

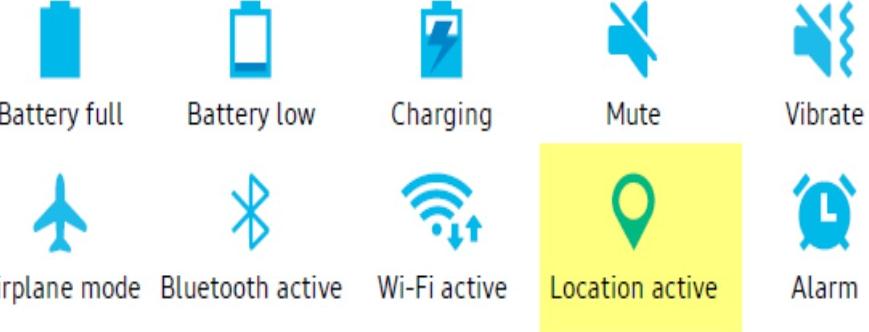
Claim 1	Corresponding Structure in Accused Systems
	<p>After completing the setup process users can validate and control settings for device location via the Settings app and navigating to Google settings, then Location (Figure 4).</p>  <p>Figure 4: Location settings after Android device setup process</p> <p>As demonstrated in Figure 4, if users accept Google's defaults during the setup process, the Android device is configured with Location Services enabled, Wi-Fi and Bluetooth scanning engaged, and Location History active.</p> <p>Attachment 38 (Google, Android and Location Tracking) at 5.</p>

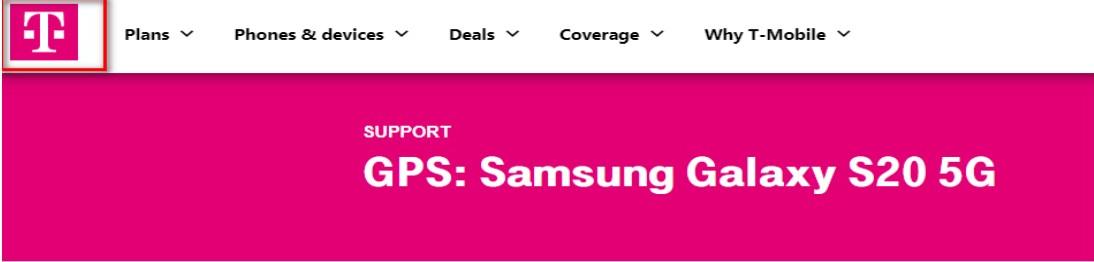
Claim 1	Corresponding Structure in Accused Systems
	<p>Users can choose to disable GLS during the set-up process. However, if a user attempts to disable GLS, a warning dialogue box prompts an extreme scenario: “device location for all apps is turned off and you may not be able to locate your device if it is lost.” (Figure 5) Note as well, the action prompt is to “Turn on Location” – reversing the user choice triggering the warning. Further, as described immediately below, many Google and third party apps will not function unless GLS is turned on. Therefore, Google forces user into an impossible ultimatum, have their every move constantly monitored, tracked, and stored or lose the functionality of their expensive smartphone.</p> <p>If a user disables Location Services but then attempts to use a location aware app or service on their device, she will see the dialogue box shown in Figure 6. If the user clicks “OK” the service is enabled for the entire device and permanently, rather than enabling Location Services only for that particular app or service requesting the functionality.</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p>Figure 5: Location Services Warning</p> </div> <div style="text-align: center;">  <p>Figure 6: Re-Enable Location Services</p> </div> </div> <p>Attachment 38 (Google, Android and Location Tracking) at 6.</p> <p>We collect information about your location when you use our services, which helps us offer features like driving directions for your weekend getaway or showtimes for movies playing near you.</p> <p>Your location can be determined with varying degrees of accuracy by:</p> <ul style="list-style-type: none"> • GPS • IP address • Sensor data from your device • Information about things near your device, such as Wi-Fi access points, cell towers, and Bluetooth-enabled devices <p>The types of location data we collect depend in part on your device and account settings. For example, you can turn your Android device's location on or off using the device's settings app. You can also turn on Location History if you want to create a private map of where you go with your signed-in devices.</p> <p>Attachment 29 (Google Privacy Policy) at 4.</p>

Claim 1	Corresponding Structure in Accused Systems
	 <p>Attachment 39 (Google Map_Permissions) at 1.</p> <p>Flow for obtaining user location</p> <p>Here's the typical flow of procedures for obtaining the user location:</p> <ol style="list-style-type: none"> 1. Start application. 2. Sometime later, start listening for updates from desired location providers. 3. Maintain a "current best estimate" of location by filtering out new, but less accurate fixes. 4. Stop listening for location updates. 5. Take advantage of the last best location estimate. <p>Figure 1 demonstrates this model in a timeline that visualizes the period in which an application is listening for location updates and the events that occur during that time.</p>  <p>Attachment 12 (Location is estimated using cell tower/wi-fi network) at 5.</p>

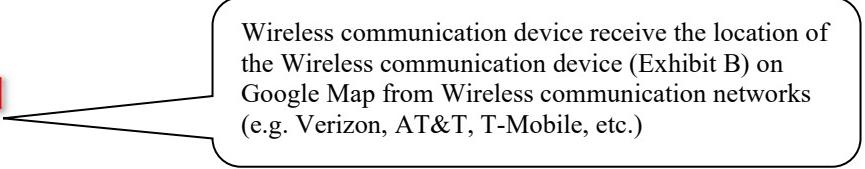
Claim 1	Corresponding Structure in Accused Systems
	<p>There are 3 location providers in Android.</p> <p>They are:</p> <p>gps -> (GPS, AGPS): Name of the GPS location provider. This provider determines location using satellites. Depending on conditions, this provider may take a while to return a location fix. Requires the permission android.permission.ACCESS_FINE_LOCATION.</p> <p>network -> (AGPS, CellID, WiFi MACID): Name of the network location provider. This provider determines location based on availability of cell tower and WiFi access points. Results are retrieved by means of a network lookup. Requires either of the permissions android.permission.ACCESS_COARSE_LOCATION or android.permission.ACCESS_FINE_LOCATION.</p> <p>passive -> (CellID, WiFi MACID): A special location provider for receiving locations without actually initiating a location fix. This provider can be used to passively receive location updates when other applications or services request them without actually requesting the locations yourself. This provider will return locations generated by other providers. Requires the permission android.permission.ACCESS_FINE_LOCATION, although if the GPS is not enabled this provider might only return coarse fixes. This is what Android calls these location providers, however, the underlying technologies to make this stuff work is mapped to the specific set of hardware and telco provided capabilities (network service).</p> <p>The best way is to use the “network” or “passive” provider first, and then fallback on “gps”, and depending on the task, switch between providers. This covers all cases, and provides a lowest common denominator service (in the worst case) and great service (in the best case).</p> <p>Attachment 41 (Android Location Providers - GPS or Network Provider?) at 1 & 2.</p> <p>Accuracy</p> <p>You can specify location accuracy using the <code>setPriority()</code> method, passing one of the following values as the argument:</p> <ul style="list-style-type: none"> • PRIORITY_HIGH_ACCURACY provides the most accurate location possible, which is computed using as many inputs as necessary (it enables GPS, Wi-Fi, and cell, and uses a variety of Sensors), and may cause significant battery drain. • PRIORITY_BALANCED_POWER_ACCURACY provides accurate location while optimizing for power. Very rarely uses GPS. Typically uses a combination of Wi-Fi and cell information to compute device location. • PRIORITY_LOW_POWER largely relies on cell towers and avoids GPS and Wi-Fi inputs, providing coarse (city-level) accuracy with minimal battery drain. • PRIORITY_NO_POWER receives locations passively from other apps for which location has already been computed. <p>The location needs of most apps can be satisfied using the balanced power or low power options. High accuracy should be reserved for apps that are running in the foreground and require <i>real time</i> location updates (for example, a mapping app).</p> <p>Attachment 42 (Optimize location for battery) at 2.</p> <p>Traffic conditions [edit]</p> <p>In 2007, Google began offering traffic data as a colored overlay on top of roads and motorways to represent the speed of vehicles on particular roads. Crowdsourcing is used to obtain the GPS-determined locations of a large number of cellphone users, from which live traffic maps are produced.^{[59][60][61]}</p> <p>Google has stated that the speed and location information it collects to calculate traffic conditions is anonymous.^[62] Options available in each phone's settings allow users not to share information about their location with Google Maps.^[63] Google stated, "Once you disable or opt out of My Location, Maps will not continue to send radio information back to Google servers to determine your handset's approximate location."^[64] [failed verification]</p> <p>Attachment 43 (Google Maps Wikipedia) at 5 & 6.</p>

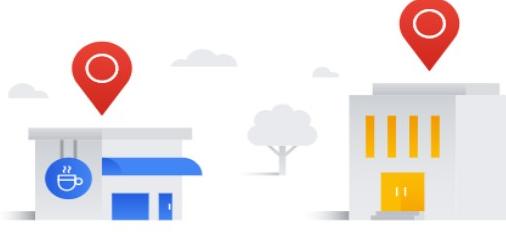
Claim 1	Corresponding Structure in Accused Systems
<p>wherein the second processor selectively acquires the information indicative of a location of the wireless mobile communications device dependent on the setting of preference flags,</p>	<p>Plaintiff contends each Exhibit-B wireless mobile can set preference flags that enable or disable accessibility to data relevant to the device's location by Location-Based Services (LBS) providers. Such programmability by a wireless device is at times known as a privacy setting. Further, such programmability is available by location-permission granting (wireless mobile communications device must grant permission).</p> <p>The LBS providers' processors select to determine a wireless mobile communications device's location if the preference flags applicable to that device have been set for enablement. The processors select to not determine a wireless mobile communications device's location if the preference flags applicable to that device have not been set for enablement.</p> <p>The following exemplifies this limitation's existence in Accused Systems:</p> <div style="border: 1px solid #ccc; padding: 10px; margin-top: 10px;"> <div style="display: flex; align-items: center; gap: 10px;"> Settings </div> <div style="background-color: #ffffcc; padding: 5px; border-radius: 10px; margin-top: 10px;"> Location </div> <div style="border: 1px solid #ccc; padding: 5px; margin-top: 10px;"> <p>Google map estimated the location of the device based upon GPS, mobile network or Wi-Fi method. Further, the Google Map hardware/software will be able/not able to locate the Wireless communication device (Exhibit B) if "Location" flag is turned ON/OFF respectively.</p> </div> <div style="border: 2px solid red; padding: 5px; margin-top: 10px;"> <p>Location services use a combination of GPS, mobile network and Wi-Fi to determine the location of your device.</p> </div> <div style="background-color: #ffffcc; padding: 5px; border-radius: 10px; margin-top: 10px;"> <ol style="list-style-type: none"> 1. From Settings, tap Location. 2. Tap to turn on Location services. </div> <div style="margin-top: 10px;"> TIP Some apps require location services be turned on for full functionality. </div> <p style="margin-top: 20px;">Attachment 15 (Turn ON/OFF the location setting) at 161.</p> </div>

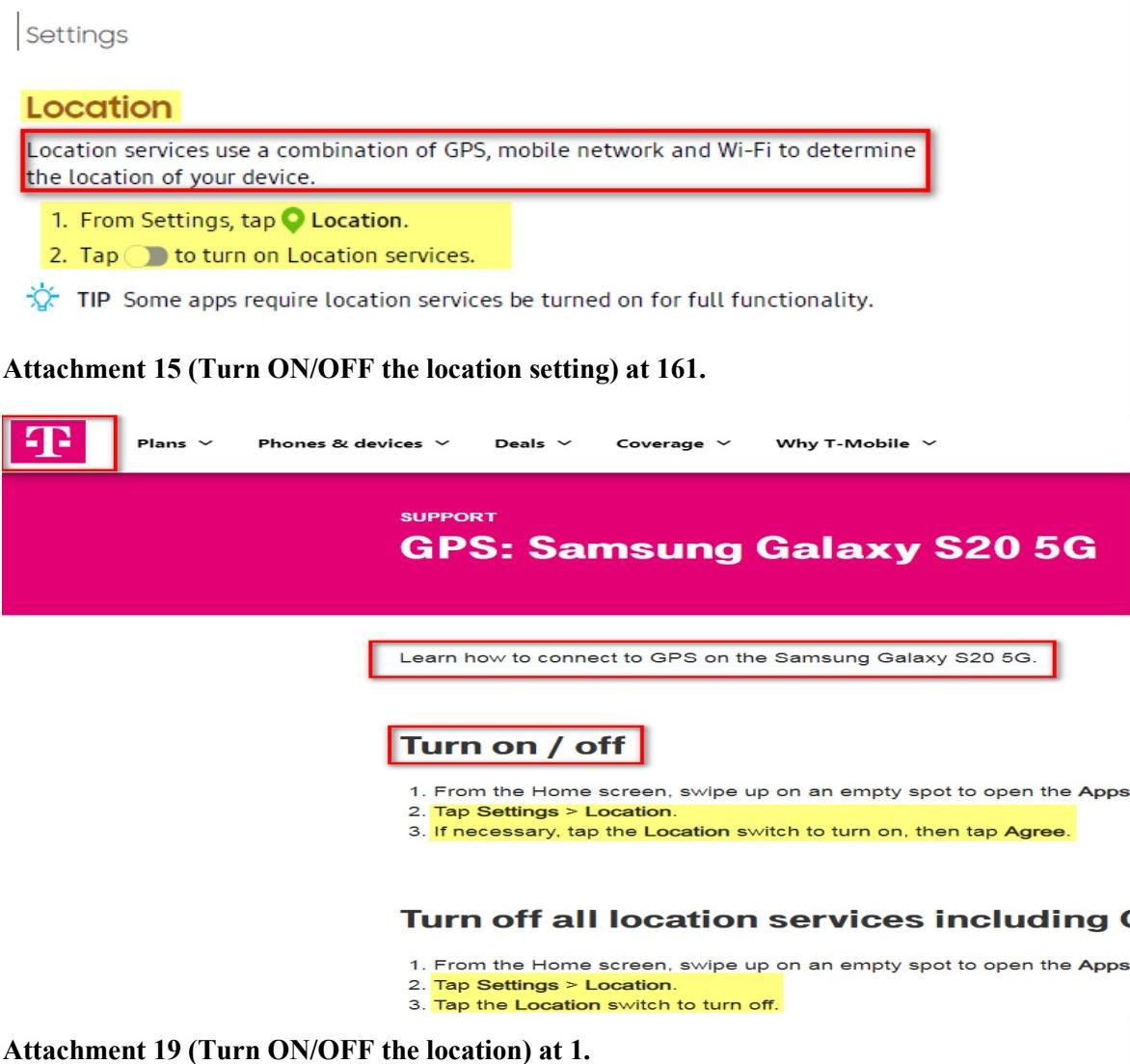
Claim 1	Corresponding Structure in Accused Systems																				
	<p>Status bar</p> <p>The Status bar provides device information on the right side and notification alerts on the left.</p> <p>Status icons</p>  <table border="0"> <tr> <td>Battery full</td> <td>Battery low</td> <td>Charging</td> <td>Mute</td> <td>Vibrate</td> </tr> <tr> <td>Airplane mode</td> <td>Bluetooth active</td> <td>Wi-Fi active</td> <td style="background-color: yellow;">Location active</td> <td>Alarm</td> </tr> </table> <p>Notification icons</p>  <table border="0"> <tr> <td>Missed calls</td> <td>Call in progress</td> <td>Call on hold</td> <td>New message</td> <td>Voicemail</td> </tr> <tr> <td>New email</td> <td>Download</td> <td>Upload</td> <td>Wi-Fi available</td> <td>App update</td> </tr> </table> <div data-bbox="1305 760 1517 1246" style="border: 1px solid black; padding: 5px;"> <p>Google Map hardware/software will be able/not able to locate the Wireless communication device (Exhibit B) if “Location” flag is turned ON/OFF respectively</p> </div> <p>Attachment 15 (Icon for turn ON/OFF the location setting) at 161.</p>	Battery full	Battery low	Charging	Mute	Vibrate	Airplane mode	Bluetooth active	Wi-Fi active	Location active	Alarm	Missed calls	Call in progress	Call on hold	New message	Voicemail	New email	Download	Upload	Wi-Fi available	App update
Battery full	Battery low	Charging	Mute	Vibrate																	
Airplane mode	Bluetooth active	Wi-Fi active	Location active	Alarm																	
Missed calls	Call in progress	Call on hold	New message	Voicemail																	
New email	Download	Upload	Wi-Fi available	App update																	

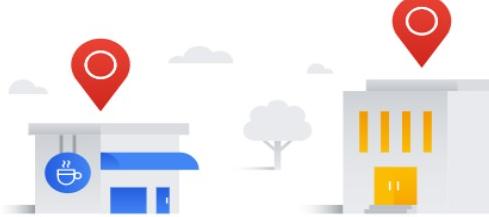
Claim 1	Corresponding Structure in Accused Systems
	 <p>The screenshot shows a T-Mobile support page for the Samsung Galaxy S20 5G. At the top, there's a navigation bar with links for 'Plans', 'Phones & devices', 'Deals', 'Coverage', and 'Why T-Mobile'. Below the navigation, a large red banner reads 'SUPPORT' and 'GPS: Samsung Galaxy S20 5G'. Underneath the banner, a red-bordered box contains the text 'Learn how to connect to GPS on the Samsung Galaxy S20 5G.' Below this, another red-bordered box contains the heading 'Turn on / off'. A numbered list follows: 1. From the Home screen, swipe up on an empty spot to open the Apps tray. 2. Tap Settings > Location. 3. If necessary, tap the Location switch to turn on, then tap Agree. Further down, another red-bordered box contains the heading 'Turn off all location services including GPS'. A numbered list follows: 1. From the Home screen, swipe up on an empty spot to open the Apps tray. 2. Tap Settings > Location. 3. Tap the Location switch to turn off.</p> <p>Attachment 19 (Turn ON/OFF the location) at 1.</p>

Claim 1	Corresponding Structure in Accused Systems
	<p style="text-align: right;">Personal Business Shop Why Verizon Support</p> <p>Home > Support > Google > Google Pixel 4a > Google Pixel 4a - Turn GPS Location On / Off</p> <h2 style="background-color: yellow; color: black; padding: 10px;">Google Pixel 4a - Turn GPS Location On / Off</h2> <p>◊ Satellite or standalone GPS services require more power and have a greater effect on battery life.</p> <ol style="list-style-type: none"> 1. From a Home screen, swipe up to display all apps. 2. Navigate: Settings > Location. 3. Tap the Use location switch to turn on  or off  → You must turn this feature on to adjust GPS services. 4. If presented, review the disclaimer(s) then tap AGREE. <p style="border: 1px solid black; border-radius: 10px; padding: 10px; margin-left: 20px;">Google Map hardware/software will be able/not able to locate the Wireless communication device (Exhibit B) if “Location” flag is turned ON/OFF respectively</p> <p>Attachment 20 (Turn ON/OFF the location) at 1.</p>

Claim 1	Corresponding Structure in Accused Systems
	<p>Help your phone get a more accurate location (Google Location Services a.k.a. Google Location Accuracy)</p> <p>Turn your phone's location accuracy on or off</p> <ol style="list-style-type: none"> 1. Open your device's Settings app. 2. Tap Location > Advanced > Google Location Accuracy. 3. Turn Improve Location Accuracy on or off. <p>When Google Location Accuracy is on</p> <p>When you have Google Location Accuracy turned on, your phone uses these sources to get the most accurate location:</p> <ul style="list-style-type: none"> • GPS • Wi-Fi • Mobile networks • Sensors  <p>Wireless communication device receive the location of the Wireless communication device (Exhibit B) on Google Map from Wireless communication networks (e.g. Verizon, AT&T, T-Mobile, etc.)</p> <p>When Google Location Accuracy is off</p> <p>Let your phone scan for nearby networks or devices</p> <p>To help apps get better location info, you can let your phone scan for nearby Wi-Fi access points or Bluetooth devices.</p> <ol style="list-style-type: none"> 1. Open your device's Settings app. 2. Tap Location > Wi-Fi and Bluetooth scanning. 3. Turn Wi-Fi scanning or Bluetooth scanning on or off. <p>Attachment 21 (Manage your Pixel phone's location settings) at 2.</p>

Claim 1	Corresponding Structure in Accused Systems
	<p>Your location information</p>  <p>We collect information about your location when you use our services, which helps us offer features like driving directions for your weekend getaway or showtimes for movies playing near you.</p> <p>Your location can be determined with varying degrees of accuracy by:</p> <ul style="list-style-type: none"> • GPS • IP address • Sensor data from your device • Information about things near your device, such as Wi-Fi access points, cell towers, and Bluetooth-enabled devices <p>The types of location data we collect depend in part on your device and account settings. For example, you can turn your Android device's location on or off using the device's settings app. You can also turn on Location History if you want to create a private map of where you go with your signed-in devices.</p>
	<p>Attachment 29 (Google privacy policy) at 4.</p> <p>wherein the second processor acquires the information indicative of a location of the wireless mobile communications device if the preference flags are set to a state that permits tracking of the wireless mobile communications device,</p> <p>Plaintiff contends each Exhibit-B wireless mobile can set preference flags that enable or disable accessibility to data relevant to the device's location by Location-Based Services (LBS) providers. The LBS providers' processors select to determine a wireless mobile communications device's location if the preference flags applicable to that device have been set for enablement. The processors select to not determine a wireless mobile communications device's location if the preference flags applicable to that device have not been set for enablement.</p> <p>The Navigation hardware/software will only be able to determine and track the location of the Wireless communication device (Exhibit B) such as but not limited to including but not limited to Google's branded devices such as Google Pixel 5, pixel 4a 5G, pixel 4a, pixel 4 XL, pixel 4, pixel 3a XL, pixel 3a, pixel 3 XL, pixel 3, pixel 2, pixel 2 XL, pixel XL, pixel, pixel C or other (third-parties) branded devices such as Samsung Galaxy S20 Ultra, Galaxy S20 plus, Galaxy S20, Galaxy Z fold, Galaxy S10, Galaxy A series, etc. (refer Exhibit B for complete list), Plaintiff contends each Exhibit-B wireless mobile can set preference flags that enable or disable accessibility to data relevant to the device's location by Location-Based Services (LBS) providers. Such programmability by a wireless device is at times known as a privacy setting. Further, such programmability is available by location-permission granting (wireless mobile communications device must grant permission).</p> <p>Plaintiff contends that if the preference flags are enabled (i.e., the wireless mobile communication device's user has granted permission), the LBS providers' processors</p> <p>Screenshot of the "Location settings" associated with Google Maps app installed on an Android communications device.</p>

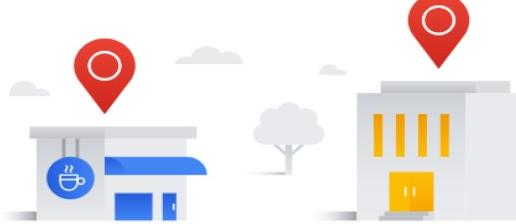
Claim 1	Corresponding Structure in Accused Systems
	<p>proceed with determining the device's location and, when determined, communicates that location to the first processor through the second RF transceiver (which, as discussed above, is a transceiver to which the LBS-providers' processors communicatively couple). The LBS-providers' processors are programmed to estimate the location of the device from 3 sources: GPS (GPS uses satellites and knows your location within a few meters), Wi-Fi (the location of nearby Wi-Fi networks helps Maps know where you are), and cell towers (cell tower can be accurate up to a few thousand meters).</p> <p>The following exemplifies this limitation's existence in Accused Systems:</p>  <p>The screenshot shows a T-Mobile support article for the Samsung Galaxy S20 5G. At the top, there is a navigation bar with links for Plans, Phones & devices, Deals, Coverage, and Why T-Mobile. Below the navigation bar, the word "SUPPORT" is written in white capital letters. The main title of the article is "GPS: Samsung Galaxy S20 5G". A red box highlights the first step of the "Turn on / off" section: "From the Home screen, swipe up on an empty spot to open the Apps". Another red box highlights the third step: "Tap Settings > Location". A tip icon with the text "TIP Some apps require location services be turned on for full functionality." is also present.</p> <p>Attachment 15 (Turn ON/OFF the location setting) at 161.</p> <p>Turn on / off</p> <ol style="list-style-type: none"> From the Home screen, swipe up on an empty spot to open the Apps Tap Settings > Location If necessary, tap the Location switch to turn on, then tap Agree. <p>Turn off all location services including GPS</p> <ol style="list-style-type: none"> From the Home screen, swipe up on an empty spot to open the Apps Tap Settings > Location Tap the Location switch to turn off. <p>Attachment 19 (Turn ON/OFF the location) at 1.</p>

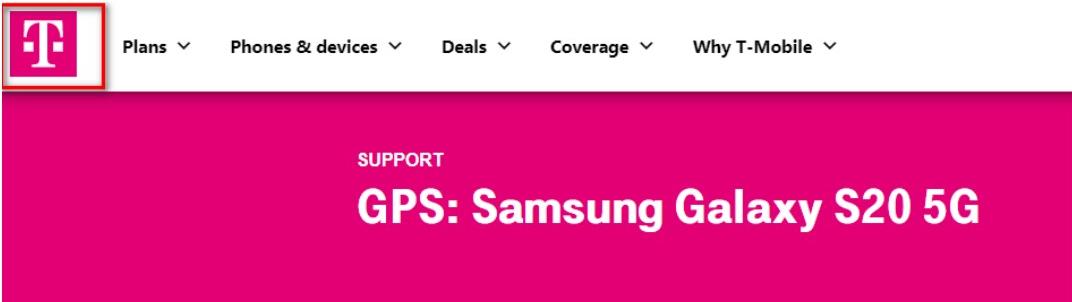
Claim 1	Corresponding Structure in Accused Systems
	<p data-bbox="388 236 682 264">Your location information</p>  <div data-bbox="388 629 1405 682" style="border: 1px solid red; padding: 5px;"> <p data-bbox="388 629 1405 682">We collect information about your location when you use our services, which helps us offer features like driving directions for your weekend getaway or showtimes for movies playing near you.</p> </div> <p data-bbox="388 724 964 749">Your location can be determined with varying degrees of accuracy by:</p> <ul data-bbox="388 787 1388 977" style="list-style-type: none"> <li data-bbox="388 787 474 813">• GPS <li data-bbox="388 840 523 865">• IP address <li data-bbox="388 893 682 918">• Sensor data from your device <li data-bbox="388 946 1388 971">• Information about things near your device, such as Wi-Fi access points, cell towers, and Bluetooth-enabled devices <div data-bbox="388 1009 1413 1094" style="border: 1px solid red; padding: 5px;"> <p data-bbox="388 1009 1413 1094">The types of location data we collect depend in part on your device and account settings. For example, you can turn your Android device's location on or off using the device's settings app. You can also turn on Location History if you want to create a private map of where you go with your signed-in devices.</p> </div> <p data-bbox="355 1136 910 1161">Attachment 29 (Google privacy policy) at 4.</p>

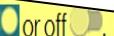
Claim 1	Corresponding Structure in Accused Systems
	 <div style="text-align: right; margin-top: -20px;"> Personal Business Shop Why Verizon Support </div> <hr/> <p>Home > Support > Google > Google Pixel 4a > Google Pixel 4a - Turn GPS Location On / Off</p> <div style="background-color: #ffff00; padding: 10px; text-align: center;"> <h2>Google Pixel 4a - Turn GPS Location On / Off</h2> </div> <p>◊ Satellite or standalone GPS services require more power and have a greater effect on battery life.</p> <ol style="list-style-type: none"> 1. From a Home screen, swipe up to display all apps. 2. Navigate: Settings > Location. 3. Tap the Use location switch to turn on  or off . <p>→ You must turn this feature on to adjust GPS services.</p> <ol style="list-style-type: none"> 4. If presented, review the disclaimer(s) then tap AGREE. <p>Attachment 20 (Turn ON/OFF the location) at 1.</p>

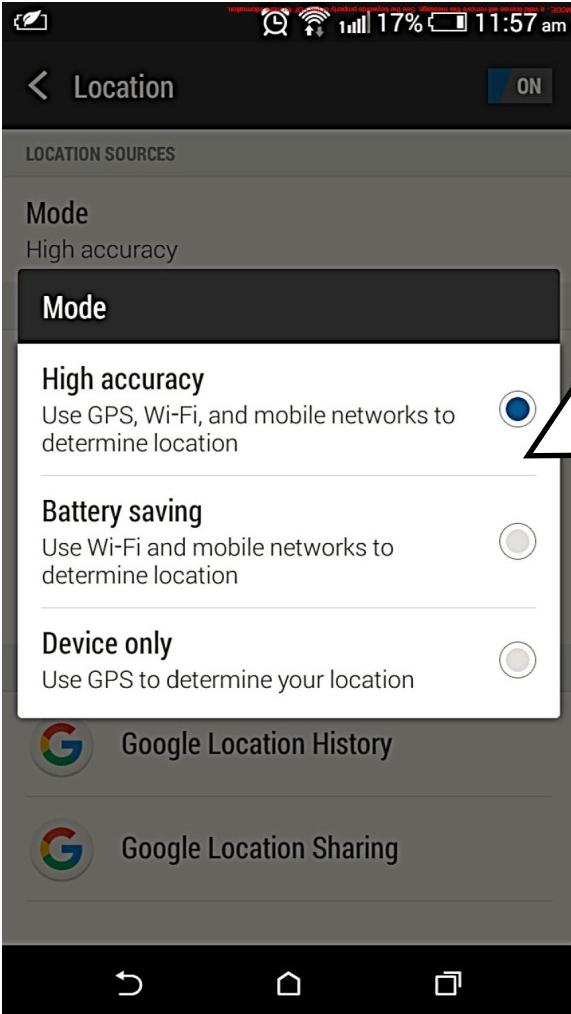
Claim 1	Corresponding Structure in Accused Systems
	<p>Turn location on or off for your phone</p> <ol style="list-style-type: none"> 1. Open your phone's Settings app. 2. Tap Location. If you have a work profile, tap Advanced. 3. At the top, turn Use location on or off. <p>Tip: You can also turn your phone's location on or off with Quick Settings. Learn about Quick Settings.</p> <p>When Location is on</p> <ul style="list-style-type: none"> • Apps can find your phone's location to give you location-based info or services. Learn how to change app location settings. • If Google Location Accuracy is on, Google Location Services can collect data to improve location-based services. Learn about Google Location Services. • You can get search results and ads in apps based on your phone's location. • You can locate where your phone is if you lose it. Learn about Find My Device. • You can share your phone's location with others. Learn about Location Sharing with Google Maps and sending location in emergencies. • If you have Location History turned on, the places your phone goes will be saved. You can review and manage them later. Learn about Location History. <p>Attachment 21 (Manage your pixel phone settings) at 1.</p> <p>Help your phone get a more accurate location (Google Location Services a.k.a. Google Location Accuracy)</p> <p>Turn your phone's location accuracy on or off</p> <ol style="list-style-type: none"> 1. Open your device's Settings app. 2. Tap Location > Advanced > Google Location Accuracy. 3. Turn Improve Location Accuracy on or off. <p>When Google Location Accuracy is on</p> <p>When you have Google Location Accuracy turned on, your phone uses these sources to get the most accurate location:</p> <ul style="list-style-type: none"> • GPS • Wi-Fi • Mobile networks • Sensors <div style="border: 1px solid black; padding: 10px; margin-left: 20px;"> <p>Wireless communication device receive the location of the Wireless communication device (Exhibit B) on Google Map from Wireless communication networks (e.g. Verizon, AT&T, T-Mobile, etc.)</p> </div> <p>When Google Location Accuracy is off</p> <p>Let your phone scan for nearby networks or devices</p> <p>To help apps get better location info, you can let your phone scan for nearby Wi-Fi access points or Bluetooth devices.</p> <ol style="list-style-type: none"> 1. Open your device's Settings app. 2. Tap Location > Wi-Fi and Bluetooth scanning. 3. Turn Wi-Fi scanning or Bluetooth scanning on or off. <p>Attachment 21 (Manage your Pixel phone's location settings) at 2.</p>

Claim 1	Corresponding Structure in Accused Systems
<p>and wherein the second processor does not acquire the information indicative of the location of the wireless mobile communications device if the preference flags are set to a state that prohibits tracking of the wireless mobile communications device.</p>	<p>Plaintiff contends that if the preference flags are not enabled (i.e., the wireless-mobile-communication device's user has not granted permission), LBS provider application hardware/software, will not be able to determine and track the location of the Wireless communication device (Exhibit B) such as but not limited to Google's branded devices such as Google Pixel 5, pixel 4a 5G, pixel 4a, pixel 4 XL, pixel 4, pixel 3a XL, pixel 3a, pixel 3 XL, pixel 3, pixel 2, pixel 2 XL, pixel XL, pixel, pixel C or other (third-parties) branded devices such as Samsung Galaxy S20 Ultra, Galaxy S20 plus, Galaxy S20, Galaxy Z fold, Galaxy S10, Galaxy A series, etc. (refer Exhibit B for complete list), if the location flag on the Wireless communication device (Exhibit B) is turned off (that is, locations privacy settings are set to "Deny").</p> <p>The following exemplifies this limitation's existence in Accused Systems:</p> <div style="border: 1px solid #ccc; padding: 10px; margin-top: 10px;"> <p style="margin: 0;"> Settings</p> <p style="margin: 0;">Location</p> <div style="border: 2px solid red; padding: 5px; margin-top: 10px;"> <p>Location services use a combination of GPS, mobile network and Wi-Fi to determine the location of your device.</p> </div> <div style="background-color: #ffffcc; padding: 5px; margin-top: 10px;"> <ol style="list-style-type: none"> 1. From Settings, tap Location. 2. Tap to turn on Location services. </div> <div style="margin-top: 10px;"> TIP Some apps require location services be turned on for full functionality. </div> </div> <p>Attachment 15 (Turn ON/OFF the location setting) at 161.</p>

Claim 1	Corresponding Structure in Accused Systems
	<p data-bbox="388 234 698 261">Your location information</p>  <div data-bbox="388 650 1449 705" style="border: 1px solid red; padding: 5px;"> <p data-bbox="388 650 1449 705">We collect information about your location when you use our services, which helps us offer features like driving directions for your weekend getaway or showtimes for movies playing near you.</p> </div> <p data-bbox="388 747 992 772">Your location can be determined with varying degrees of accuracy by:</p> <ul data-bbox="388 815 1432 1009" style="list-style-type: none"> <li data-bbox="388 815 486 840">• GPS <li data-bbox="388 868 535 893">• IP address <li data-bbox="388 920 698 946">• Sensor data from your device <li data-bbox="388 973 1432 998">• Information about things near your device, such as Wi-Fi access points, cell towers, and Bluetooth-enabled devices <div data-bbox="388 1043 1457 1129" style="border: 1px solid red; padding: 5px;"> <p data-bbox="388 1043 1457 1129">The types of location data we collect depend in part on your device and account settings. For example, you can turn your Android device's location on or off using the device's settings app. You can also turn on Location History if you want to create a private map of where you go with your signed-in devices.</p> </div> <p data-bbox="355 1170 910 1195">Attachment 29 (Google privacy policy) at 4.</p>

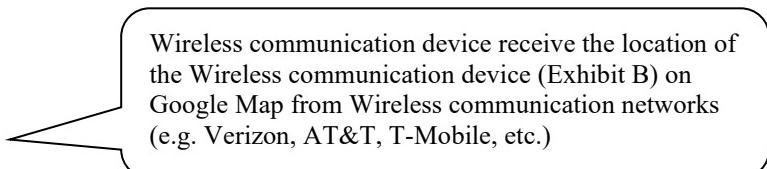
Claim 1	Corresponding Structure in Accused Systems
	 <p>The screenshot shows a red support page for a Samsung Galaxy S20 5G. At the top, there's a navigation bar with links for Plans, Phones & devices, Deals, Coverage, and Why T-Mobile. Below the navigation, the word "SUPPORT" is written in white. A large title "GPS: Samsung Galaxy S20 5G" is centered in white. Underneath the title, a red-bordered box contains the text "Learn how to connect to GPS on the Samsung Galaxy S20 5G." Below this, another red-bordered box contains the heading "Turn on / off". To the right of this heading, a numbered list provides instructions: 1. From the Home screen, swipe up on an empty spot to open the Apps tray. 2. Tap Settings > Location. 3. If necessary, tap the Location switch to turn on, then tap Agree. Further down, another red-bordered box contains the heading "Turn off all location services including GPS". To its right, a numbered list provides instructions: 1. From the Home screen, swipe up on an empty spot to open the Apps tray. 2. Tap Settings > Location. 3. Tap the Location switch to turn off.</p> <p>Attachment 19 (Turn ON/OFF the location) at 1.</p>

Claim 1	Corresponding Structure in Accused Systems
	<p style="text-align: right;">Personal Business Shop Why Verizon Support</p> <p>Home > Support > Google > Google Pixel 4a > Google Pixel 4a - Turn GPS Location On / Off</p> <h2 style="background-color: yellow; color: black; padding: 10px;">Google Pixel 4a - Turn GPS Location On / Off</h2> <p>◊ Satellite or standalone GPS services require more power and have a greater effect on battery life.</p> <ol style="list-style-type: none"> 1. From a Home screen, swipe up to display all apps. 2. Navigate: Settings > Location. 3. Tap the Use location switch to turn on  or off  → You must turn this feature on to adjust GPS services. 4. If presented, review the disclaimer(s) then tap AGREE. <div style="border: 1px solid black; border-radius: 10px; padding: 10px; width: fit-content; margin-left: 200px;"> <p>Google Map hardware/software will be not able to locate the Wireless communication device (Exhibit B) if “Location” flag is turned OFF</p> </div> <p>Attachment 20 (Turn ON/OFF the location) at 1.</p> <p style="text-align: right;">Manage your Pixel phone's location settings - Pixel Phone Help</p> <p>When Location is off</p> <ul style="list-style-type: none"> • Your phone's location isn't shared with any apps. Features that use location may not work properly. • Google Location Services won't collect data to improve location-based services. • You can get search results and ads based on your IP address. • You can't see where your phone is if you lose it. Learn about Find My Device. • You can't share your phone's location with anyone  via Google Maps. Your device can still send it to first responders in an emergency. Learn about Location Sharing with Google Maps and sending location in emergencies. • Even if you have Location History turned on, the places your phone goes won't be saved. Learn about Location History.

Claim 1	Corresponding Structure in Accused Systems
	<p>Attachment 21 (Manage your pixel phone settings) at 1.</p>  <p>By default the “Location setting” is set at “High accuracy” mode, wherein, for example, accuracy of location of a communications device determined based on locations of nearby Wi-Fi network infrastructure (access points or hotspots) is further enhanced or fine-tuned by Google Maps Server additionally using the said communications device’s GPS location and the location data obtained from the mobile network (Cell tower information and/or Location of the communications device determined through the Assisted-GPS method by the said mobile network) serving the said communications device.</p> <p>Attachment 45 (Google Maps Android app Location settings) at 1.</p>

Claim 1	Corresponding Structure in Accused Systems
<h2 data-bbox="372 255 1318 312">Find and improve your location's accuracy</h2> <p data-bbox="372 329 1450 426">Sometimes Google Maps might have trouble finding where you are located. If the GPS location of your blue dot on the map is inaccurate or the blue dot is not showing up, here are some things you can do to help fix the problem.</p> <p data-bbox="372 449 1183 481">Tip: This will also improve your search results and make them more relevant to you.</p> <hr/> <p data-bbox="393 557 806 582">Computer Android iPhone & iPad</p> <hr/> <h3 data-bbox="372 677 1002 720">See your current location on the map</h3> <ol style="list-style-type: none"> <li data-bbox="381 741 1034 772">1. On your Android phone or tablet, open the Google Maps app . <li data-bbox="381 798 1437 857">2. You'll see a blue dot, which shows where you are. If you don't see a blue dot, go to the bottom and tap Your location . <h3 data-bbox="372 925 1008 967">How Maps finds your current location</h3> <p data-bbox="372 988 855 1015">Maps estimates where you are from sources like:</p> <ul style="list-style-type: none"> <li data-bbox="381 1036 1459 1098">GPS: This uses satellites and knows your location up to around 20 meters. Note: When you're inside buildings or underground, the GPS is sometimes inaccurate. <li data-bbox="381 1106 1148 1138">Wi-Fi: The location of nearby Wi-Fi networks helps Maps know where you are. <li data-bbox="381 1146 1318 1178">Cell tower: Your connection to a cellular network can be accurate up to a few thousand meters. <p data-bbox="355 1189 1503 1248">Attachment 46 (Find and improve your location's accuracy - Android - Google Maps Help at 1.)</p>	

Claim 1	Corresponding Structure in Accused Systems
	<p>From your devices</p> <p>Many devices, like phones or computers, can work out their precise location. You can allow Google and other apps to provide you with useful features based on where your device is located. For example, if you're running late to meet your friends, you'll probably want to use a navigation app to know the quickest way to get to your destination. To get turn-by-turn directions, you may need to turn on your device's location and give the app the permission to access it. Or for some searches like "coffee shop", "bus stop" or "atm", results will usually be more helpful when precise location is available.</p> <p>On your Android device, if you choose to turn on your device location, you can use features like navigation, giving an app access to your current location, or find your phone. You can also choose which apps have permission to use your device's location with simple controls that let you turn the permission on or off for individual apps. On Android, you can see when an app is requesting to use your phone's GPS-based location when the top of your screen shows Location  Learn more</p> <p>Google Location Services</p> <p>On most Android devices, Google, as the network location provider, provides a location service called Google Location Services (GLS), known in Android 9 and above as Google Location Accuracy. This service aims to provide a more accurate device location and generally improve location accuracy. Most mobile phones are equipped with GPS, which uses signals from satellites to determine a device's location – however, with Google Location Services, additional information from nearby Wi-Fi, mobile networks, and device sensors can be collected to determine your device's location. It does this by periodically collecting location data from your device and using it in an anonymous way to improve location accuracy.</p> <p>You can disable Google Location Services at any time in your device's location settings. Your device's location will continue to work even if GLS is turned off, but the device will rely only on GPS to estimate device location for apps with the necessary permission. Google Location Services is distinct from your device's location setting. Learn more</p> <p>The settings and permissions on Android control whether your device sensors (like GPS) or network-based location (like GLS) are used to determine your location and which apps have access to that location. They do not impact how websites and apps might estimate your location in other ways, such as from your IP Address.</p> <p>Attachment 44 (How Google uses location information – Privacy & Terms – Google) at 2 &3.</p>

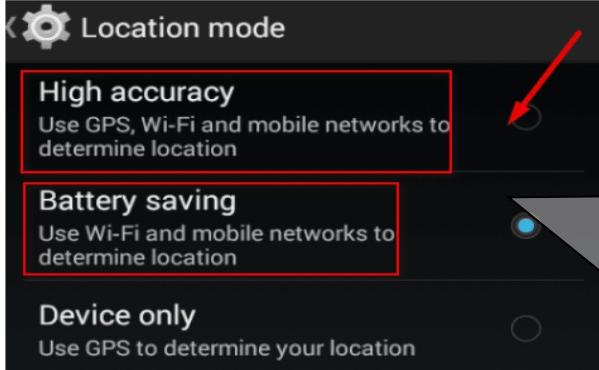
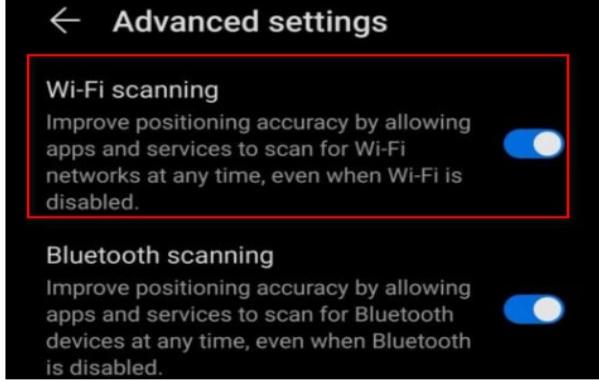


Wireless communication device receive the location of the Wireless communication device (Exhibit B) on Google Map from Wireless communication networks (e.g. Verizon, AT&T, T-Mobile, etc.)

Claim 1	Corresponding Structure in Accused Systems
	<p>Turn your phone's location accuracy on or off</p> <ol style="list-style-type: none"> 1. Open your device's Settings app. 2. Tap Location > Advanced > Google Location Accuracy. 3. Turn Improve Location Accuracy on or off. <hr/> <p>When Google Location Accuracy is on</p> <p>When you have Google Location Accuracy turned on, your phone uses these sources to get the most accurate location:</p> <ul style="list-style-type: none"> • GPS • Wi-Fi • Mobile networks • Sensors <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>When Google Location Accuracy is off</p> <p>When you turn off Google Location Accuracy, your phone uses only GPS to find location. GPS can be slower and less accurate than other sources.</p> </div> <p>Let your phone scan for nearby networks or devices</p> <p>To help apps get better location info, you can let your phone scan for nearby Wi-Fi access points or Bluetooth devices.</p> <ol style="list-style-type: none"> 1. Open your device's Settings app. 2. Tap Location > Wi-Fi and Bluetooth scanning. 3. Turn Wi-Fi scanning or Bluetooth scanning on or off. <p>Attachment 21 (Manage your Pixel phone's location settings) at 2.</p>

Claim 1	Corresponding Structure in Accused Systems
<p>If you use an older Android version</p> <p>Choose location settings (Android 9.0)</p> <p>To change location settings:</p> <ol style="list-style-type: none"> 1. Open your device's Settings app. 2. Tap Security & Location > Location. <ul style="list-style-type: none"> • If you have a work profile, tap Advanced. <p>Then, choose an option:</p> <ul style="list-style-type: none"> • Turn Location on or off: Tap Location. • Scan for nearby networks: Tap Advanced > Scanning. Turn Wi-Fi scanning or Bluetooth scanning on or off. • Turn emergency location service on or off: Tap Advanced > Google Emergency Location Service. Turn Emergency Location Service on or off. <hr/> <p>Choose location mode (Android 4.4–8.1)</p> <p>You can choose your location mode based on accuracy, speed, and battery use.</p> <ol style="list-style-type: none"> 1. Open your phone's Settings app. 2. Tap Security & Location > Location. If you don't see "Security & Location," tap Location. 3. <u>Tap Mode</u>. Then pick: <ul style="list-style-type: none"> • High accuracy: Use GPS, Wi-Fi, mobile networks, and sensors to get the most accurate location. Use Google Location Services to help estimate your phone's location faster and more accurately. • Battery saving: Use sources that use less battery, like Wi-Fi and mobile networks. Use Google Location Services to help estimate your phone's location faster and more accurately. • Device only: Use only GPS. Don't use Google Location Services to provide location information. This can estimate your phone's location more slowly and use more battery. <hr/> <p>Choose location access (Android 4.1–4.3)</p> <p>You can control what location information your phone can use.</p> <ol style="list-style-type: none"> 1. Open your phone's Settings app. 2. Under "Personal," tap Location access. 3. At the top of the screen, turn Access to my location on or off. <ul style="list-style-type: none"> • When location access is on, pick either or both of: <ul style="list-style-type: none"> • GPS satellites: Lets your phone estimate its location from satellite signals, like a GPS device in a car. • Wi-Fi & mobile network location: Lets your phone use Google Location Services to help estimate its location faster, with or without GPS. • When location access is off: <ul style="list-style-type: none"> Your phone can't find its precise location or share it with any apps. <p>Tip: If you have a tablet that more than one person uses, each person can have different location access settings.</p>	

Attachment 40 (Manage your Pixel phone's location settings) at 3 & 4.

Claim 1	Corresponding Structure in Accused Systems
	<p>1. On your Android device, go to Settings 2. Tap Location and re-enable your location services 3. Select Mode High accuracy</p>  <div data-bbox="1199 369 1428 707"> <p>The user of the wireless device can select the method of the location estimation</p> </div> <p>On some phone models, this option can be found under the Advanced Settings option.</p> <p>Select Advanced Settings and enable your device to improve positioning accuracy by allowing apps to scan for Wi-Fi networks and Bluetooth devices at any time, even if Wi-Fi or Bluetooth is disabled.</p>  <p>Attachment 33 (Google Maps Not Updating Location) at 4.</p>

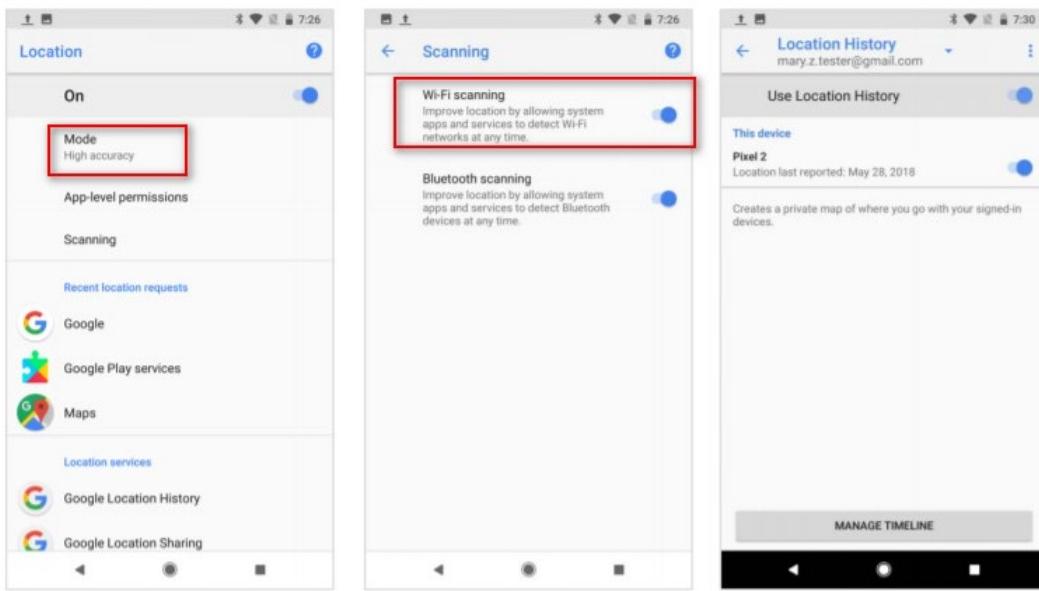
Claim 1	Corresponding Structure in Accused Systems		
	Description	Opt-In / Opt-Out	User Choices
LOCATION SERVICES	"Use Google's location service to help apps determine your location. Anonymous location data will be sent to Google when your device is on."	Opt-Out	"YES, I'M IN" or "SKIP"
LOCATION ACCURACY	Three Modes - "High accuracy", "Battery saving", and "Device only". Default setting: "High accuracy uses GPS, Wi-Fi, Bluetooth, or cellular networks to determine location".	Opt-Out	Toggle icon (right and colored for on, left and gray for off). This setting not shown during Android set-up.
LOCATION SCANNING	"Improve location accuracy by allowing apps and services to scan for Wi-Fi and Bluetooth, even when those settings are off."	Opt-Out	Toggle icon (right and colored for on, left and gray for off).
LOCATION HISTORY	"Allows Google to store a history of your location data from all devices where you are logged into your Google Account and have enabled Location Reporting. Location History and Location Reporting data may be used by any Google app or service."	Opt-Out	"YES, I'M IN" or "NO THANKS" In the context of "Give your new Assistant permission to help you"

Figure 1: Four Android settings and services that relate to location information collection.¹

Google Location Services
Google Location Services (GLS) operate at a device level and rely on sensors such as GPS, Wi-Fi, the cellular radio, and other technologies included in mobile devices to position a user in the world. If a user keeps the default settings prompted by Google, Location Services is enabled, Location Accuracy will be set to "High Accuracy"² and Location Scanning will be enabled for both Wi-Fi base stations and Bluetooth Beacons, regardless of a user's choice to turn Wi-Fi or Bluetooth on. The implications of user choices among the various Location Services settings are significant, but not intuitive, including:

- With Location Services turned on, Location Accuracy set to "Device only" and Location Scanning turned off, an Android device will only use GPS to provide the location of an Android device.
- When Location Accuracy is set to "High accuracy" and Location Scanning is enabled (the default setting for new device setup), an Android device will use sources including Wi-Fi, Bluetooth, and cellular radio to improve the accuracy of the device's position.

Attachment 38 (Google, Android and Location Tracking) at 2.

Claim 1	Corresponding Structure in Accused Systems
<p>After completing the setup process users can validate and control settings for device location via the Settings app and navigating to Google settings, then Location (Figure 4).</p>  <p>Figure 4: Location settings after Android device setup process</p> <p>As demonstrated in Figure 4, if users accept Google's defaults during the setup process, the Android device is configured with Location Services enabled, Wi-Fi and Bluetooth scanning engaged, and Location History active.</p> <p>Attachment 38 (Google, Android and Location Tracking) at 5.</p>	

Claim 1	Corresponding Structure in Accused Systems
	<p>Users can choose to disable GLS during the set-up process. However, if a user attempts to disable GLS, a warning dialogue box prompts an extreme scenario: “device location for all apps is turned off and you may not be able to locate your device if it is lost.” (Figure 5) Note as well, the action prompt is to “Turn on Location” – reversing the user choice triggering the warning. Further, as described immediately below, many Google and third party apps will not function unless GLS is turned on. Therefore, Google forces user into an impossible ultimatum, have their every move constantly monitored, tracked, and stored or lose the functionality of their expensive smartphone.</p> <p>If a user disables Location Services but then attempts to use a location aware app or service on their device, she will see the dialogue box shown in Figure 6. If the user clicks “OK” the service is enabled for the entire device and permanently, rather than enabling Location Services only for that particular app or service requesting the functionality.</p> <div data-bbox="518 608 829 1087"> </div> <div data-bbox="518 1094 829 1117" data-label="Caption">Figure 5: Location Services Warning</div> <div data-bbox="926 608 1253 1087"> </div> <div data-bbox="957 1094 1220 1138" data-label="Caption">Figure 6: Re-Enable Location Services</div> <p>Attachment 38 (Google, Android and Location Tracking) at 6.</p> <p>We collect information about your location when you use our services, which helps us offer features like driving directions for your weekend getaway or showtimes for movies playing near you.</p> <p>Your location can be determined with varying degrees of accuracy by:</p> <ul style="list-style-type: none"> • GPS • IP address • Sensor data from your device • Information about things near your device, such as Wi-Fi access points, cell towers, and Bluetooth-enabled devices <p>The types of location data we collect depend in part on your device and account settings. For example, you can turn your Android device's location on or off using the device's settings app. You can also turn on Location History if you want to create a private map of where you go with your signed-in devices.</p> <p>Attachment 29 (Google Privacy Policy) at 4.</p>

Claim 1	Corresponding Structure in Accused Systems
	 <p>Google Maps - Navigate & Explore Google LLC</p> <p>Showing permissions for all versions of this app</p> <ul style="list-style-type: none"> modify or delete the contents of your USB storage read the contents of your USB storage <p>Wi-Fi connection information</p> <ul style="list-style-type: none"> view Wi-Fi connections <p>Location</p> <ul style="list-style-type: none"> approximate location (network-based) precise location (GPS and network-based) <p>Updates to Google Maps - Navigate & Explore may automatically add additional capabilities within each group. Learn more</p> <p>Cancel</p> <p>More by Google LLC</p>

Attachment 39 (Google Map_Permissions) at 1.

27.

28. Defendant makes, uses, offers to sell, and/or sells within or imports into the U.S., wireless-network components and related applications and programs, and related services that use identified locations of wireless devices to provide tracking such that Defendant infringes claims 1–24 of the ’147 patent, literally or under the doctrine of equivalents.
29. Defendant put the inventions claimed by the ’147 Patent into service (i.e., used them); but for Defendant’s actions, the claimed-inventions embodiments involving Defendant’s products and services would never have been put into service. Defendant’s acts complained of herein caused those claimed-invention embodiments as a whole to perform, and Defendant obtaining monetary and commercial benefit from it.
30. Defendant has and continues to induce infringement. Defendants have actively encouraged or instructed others (e.g., its customers, such as Verizon, T-Mobile and Sprint), and continues to do so, on how to use its products and services (e.g., wireless-network components and related applications and programs that use identified locations of wireless devices to provide tracking of mobile devices) such to cause infringement claims 1–24 of the ’147 patent, literally or under the doctrine of equivalents. Moreover, Defendant has known and should have known of the ’147 patent, by at least by the date of the patent’s issuance, or from the issuance of the ‘284 patent, which followed the date that the patent’s underlying application was cited to Defendants by the U.S. Patent and Trademark Office during prosecution of one of Defendant’s patent applications, such that Defendant knew and should have known that it was and would be inducing infringement.
31. Defendant has and continues to contributorily infringe. Defendant has actively encouraged

or instructed others (e.g., its customers and/or the customers of its related companies, such as Verizon, T-Mobile and Sprint), and continues to do so, on how to use its products and services e.g., wireless-network components and related applications and programs that use identified locations of wireless devices to provide tracking of mobile devices) such as to cause infringement of one or more of claims 1–24 of the '147 patent, literally or under the doctrine of equivalents. Moreover, Defendant has known of the '147 patent and the technology underlying it from at least the date of issuance of the patent or from the issuance of the '284 patent, which followed the date that the patent's underlying application was cited to Defendants by the U.S. Patent and Trademark Office during prosecution of one of Defendant's patent applications, such that Defendant knew and should have known that it was and would be contributorily infringing.

32. Defendants have caused and will continue to cause Traxcell damage by infringing the '147 patent.

VI. PRAYER FOR RELIEF

WHEREFORE, Traxcell respectfully requests that this Court:

- i. enter judgment that Defendants have infringed the Patents-in-Suit;
- ii. award Traxcell damages in an amount sufficient to compensate it for Defendants' infringement of the Patents-in-Suit, in an amount no less than a reasonable royalty, together with prejudgment and post-judgment interest and costs under 35 U.S.C. § 284;
- iii. award Traxcell an accounting for acts of infringement not presented at trial and an award by the Court of additional damage for any such acts of infringement;
- iv. declare this case to be "exceptional" under 35 U.S.C. § 285 and award Traxcell its attorneys' fees, expenses, and costs incurred in this action;
- v. declare Defendants infringement to be willful and treble the damages, including attorneys'

fees, expenses, and costs incurred in this action and an increase in the damage award pursuant to 35 U.S.C. §284;

- vi. a decree addressing future infringement that either (i) awards a permanent injunction enjoining Defendants and their agents, servants, employees, affiliates, divisions, and subsidiaries, and those in association with Defendants, from infringing the claims of the Patents-in-Suit or (ii) award damages for future infringement in lieu of an injunction, in an amount consistent with the fact that for future infringement the Defendants will be adjudicated infringers of a valid patent, and trebles that amount in view of the fact that the future infringement will be willful as a matter of law; and,
- vii. award Traxcell such other and further relief as this Court deems just and proper.

JURY DEMAND

Traxcell hereby requests a trial by jury on issues so triable by right.

Respectfully submitted,

Ramey & Schwaller, LLP

By: /s/ William P. Ramey, III
William P. Ramey, III
Texas Bar No. 24027643
5020 Montrose Blvd., Suite 800
Houston, Texas 77006
(713) 426-3923 (telephone)
(832) 900-4941 (fax)
wramey@rameyfirm.com

Attorneys for Traxcell Technologies, LLC